FLIGHT

MAGAZINE

JUNE 1959
One Dollar

TENTH ANNUAL LOCAL AIR SERVICE ISSUE

the Caribou

. . . Introduces a new concept in transport aircraft design.

. . . The Caribou carries payloads up to 3½ tons – but is unique in its ability to operate from short, improvised air strips.

. . . Actualtake-off distance – 490 feet with zero wind. (With a 10-mile headwind, take-off distance is 345 feet). Approach speed – 80 mph – and touch-down speed – 60 mph – enable the Caribou to land in 425 feet ground run. (300 feet with 10-mile headwind).

. . . Large rear loading door provides access to thousand cubic foot cabin, permits cargo dropping in flight.

. . . As civil transport, accomodates 27 passengers and baggage. As troop transport, 28 combat troops

. . . Air ambulance takes 14 litters, 6 sit-up patients or attendants.

. . . Structure is conventional, simple, rugged ... designed for minimum field maintenance and low operating costs.

. . . STOL ability enables the Caribou to operate from tiny jungle landing strips, from beachheads, or from short fields close in to centres of population – ushers in a new era of low-cost air transportation.

DE HAVILLAND AIRCRAFT OF CANADA

DOWNSVIEW *ONTARIO*

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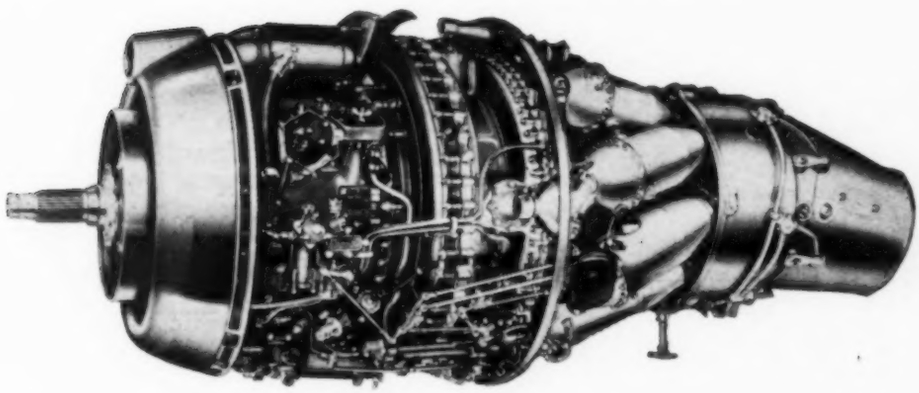
ROLLS-ROYCE

DART PROP-JETS

power

THE VICKERS VISCOUNT,
THE FAIRCHILD F-27,
THE HANDLEY PAGE HERALD,
THE GRUMMAN GULFSTREAM,
THE ARMSTRONG WHITWORTH ARGOSY
and have been chosen for
THE AVRO 748



For airline, local service carrier and executive operation, the Rolls-Royce Dart is the most proven prop-jet in the world. It has flown over 7,000,000 hours in scheduled airline service and has an overhaul life of up to 2,300 hours.

ROLLS-ROYCE LIMITED, DERBY, ENGLAND

ERO ENGINES • MOTOR CARS • DIESEL AND GASOLINE ENGINES • ROCKET MOTORS • NUCLEAR PROPULSION

Midwest Workshop for Executive Aircraft

President, W. V. Simonsen—
25 years in aviation.

Vice-President, C. L. Harrington—
10 years in executive aircraft.

NAC's big hangar at Wold Chamberlain Field, Minneapolis, Minnesota. 24-hour service is available.

Custom overhaul of 650 to 1500 h.p. engines at Holman Field, St. Paul.

NAC refuels Ozark at Wold Chamberlain. Both Simonsen and Harrington concur: "Phillips 66 Aviation Products are outstanding . . . they're leaders in the field."

● In and around the Twin Cities, Northwestern Aeronautical Company has a reputation for craftsmanship and technical competence. With well-equipped bases at Holman Field Airport in St. Paul and Wold Chamberlain Field in Minneapolis, NAC does airframe, engine, radio, instrument and hydraulic maintenance, as well as custom modification and complete overhaul of engines from 650 to 1500 horsepower. Their creed is service and safety. And it has paid off . . . judging from the number of local and transient planes they service, the volume of special engine work handled, and the country-wide acceptance of their DC-3 and Lodestar conversions.

In addition to taking care of private and business aircraft, and refueling airlines with Phillips *66* Aviation Gasoline (91 and 100 octane) . . . NAC is a vital part of the Army's contractual maintenance program.

For all of its various operations, NAC now has over 200 employees, including almost 50 certified A&E mechanics. When it is considered that NAC started with less than 50 on their payroll in 1946 . . . the success of their high-calibre work and service speaks for itself.

AVIATION DIVISION • PHILLIPS PETROLEUM COMPANY • BARTLESVILLE, OKLAHOMA

AIR Report

Significant Trends and News

LOOK FOR NUCLEAR-POWERED HELICOPTER DESIGN to be proposed by Bell Helicopter Corp. as an Army project. Bell has completed studies of the project on its own initiative.

NARCO WILL DEVELOP LIGHT-WEIGHT, LOW-COST DME under a Federal Aviation Agency contract worth $273,000 and calling for delivery of 20 distance measuring equipment units by September, 1960.

APRIL WAS BEST BUSINESS AIRCRAFT SALES MONTH IN HISTORY for Beech Aircraft Corp., sales totalling $5,434,551 for the month. . . . Reduced "flight time minimums" posted by Associated Aviation Underwriters for pilots of the Beech Travel Air are only 10 to 25% of the twin-engine experience normally required to qualify for insurance on light twins. Travel Air minimums are only 25 hrs. of twin-engine flying time and only 600 hrs. of total flying time, as compared to 100 to 250 hrs. and 1,000 hrs. normally required. . . . The Chilean Air Force has bought 20 additional Mentor trainers from Beech Aircraft. . . . Beech Aircraft has won a Navy-Air Force developmental contract for a Mach 2 missile-target.

SOUTH AMERICAN FACTORY FOR PRODUCTION OF CESSNA BUSINESS AND TRAINING PLANES may be built as result of current negotiations by Cessna Aircraft Co. with government of Argentina. . . . Cessna is now offering Model 310C purchasers factory-installed transistorized Mitchell autopilot weighing only 12.9 lbs. and priced at $2,965 installed.

PROPJET GRUMMAN GULFSTREAM was certificated by FAA on May 25, with production already at 3 Gulfstreams per month and with 40 orders on hand for the 10-12-passenger, 357-mph., Rolls-Royce-powered corporate transport.

CANADAIR 540 TURBO-PROP operations proved impressive under actual airline conditions during an evaluation by Mohawk Airlines over a five-segment portion of its system. The 540 averaged a 10-15% improvement in block time over Mohawk's Convair 240 operations. The 540's climb-out averaged over 1,500 fpm., cruise averaged 300 mph. with overall average block speed 200 mph., but most impressive factor was improved payload capability. Mohawk currently fuels its 46-passenger Convair 240 three times during the Utica-Rome-

(Continued on page 8)

FLIGHT MAGAZINE

JUNE, 1959 VOL. 48, No. 6

THIS MONTH'S COVER shows a Piedmont Airlines Fairchild F-27 propjet, one of 20 new turbine-powered transports already in operation by local service airlines. In service with four local carriers—Piedmont, West Coast, Bonanza and Pacific—the pressurized, air-conditioned F-27 has been a success from the very start and is generating more passenger traffic than was expected. It is the first transport in production designed especially for short-haul feeders.

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Jet Transport Can Be the Safest—BY MAJ. GEN. J. D. CALDARA—VITAL NEEDS FOR SAFETY BASED ON AIR FORCE EXPERIENCE . . 122

New Business in the Hangar—NATIONWIDE ROUNDUP OF INTERESTING DEVELOPMENTS IN BUSINESS FLYING 131

GEORGE E. HADDAWAY, Editor-Publisher; TOM ASHLEY, Managing Editor; FRED N. STONES, JR., Business Manager; LOUISE ROBERTSON, Circulation; E. H. PICKERING, Consultant; P. O. Box 750 (2700 N. Haskell Ave.), Dallas, Texas — Telephone TAylor 3-6191.

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Lockheed's background of almost 50 years in the air transportation field is behind this newest transport-tool for business on-the-go and going ahead. Efficient, safe, fast and in production at Lockheed's Georgia Division – the JetStar offers the world's busiest men convenience and competitive advantage for the 1960's and 70's.

If you would like a JetStar Route Survey made of your air transportation requirements – without cost to you – please write: JetStar Commercial Sales, Lockheed Georgia Division, Marietta, Georgia.

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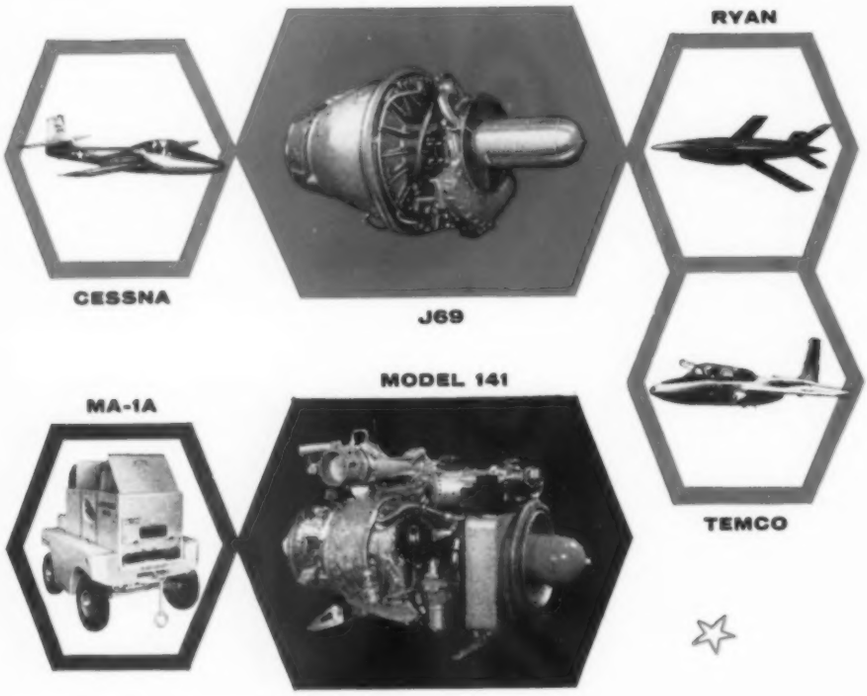

Continental Aviation & Engineering Corporation has more than 10 years' experience with small gas turbine engines.... Four versions of the J69 turbojet—delivering 920 to 1700 lbs. thrust—are in operation today. . . . The Model 141 turbine air compressor engine is widely used in jet aircraft ground support equipment. . . . Research and development programs are continuously in process on uprated turbines, new turbine configurations, solid fuel propellents, and solid fuel ramjet vehicles.

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SUBSIDIARY OF CONTINENTAL MOTORS CORPORATION

AIR REPORT

(Continued from page 5)

Detroit round trip, with its passenger payload restricted to 45 on one segment and to 44 on two other segments. But the Convair 540 on the same round trip could operate terminal to terminal one way without refueling and still maintain its 58-passenger capacity except on the 38-mile Utica-Syracuse segment, when it would be restricted to 54.

C. A. MYHRE, former president of Frontier Airlines at Denver, is now with Pacific Air Lines, San Francisco, as vice president in charge of finance. Myhre was treasurer of Frontier at its inception in 1945, became president in 1953 but left in January, 1959, when new ownership took over Frontier.

C. A. Myhre

JOSEPH H. FITZGERALD has been promoted to be executive vice president and general manager of Ozark Air Lines at St. Louis and is directing all activities in the absence of Laddie Hamilton, president, recently granted an extended leave of absence for reasons of ill health.

Airmen's Calendar

June 19—Flight to Alaska, sponsored by the 49er Air Cruise Assoc., from Miami; contact Harry B. Collins, 375 NE 154th St., North Miami Beach 62, Fla.

June 23-25—33rd Aircraft Distributors and Manufacturers Assn. Meeting, St. Francis Hotel, San Francisco, Calif.

June 29-July 31—National Aviation Workshop for School Teachers, Montana State University, Missoula, Mont.

July 1-10—National Soaring Contests, Harris Hill, Elmira, N. Y.

July 4-8—All-Woman Transcontinental Air Race, Lawrence, Mass., to Spokane, Wash.

July 19—Annual Dawn Patrol Breakfast and Events, Haines Airport, Three Rivers, Mich.

July 26—Oregon Centennial Air Circus and Jaycee Air Fair, Hillsboro, Oregon.

July 28-31—Association of Local and Territorial Airlines Quarterly Regional Meeting, Anchorage and Fairbanks, Alaska.

Aug. 31-Sept. 2—Annual Army-Navy Instrumentation Program Symposium, Statler Hilton Hotel, Dallas.

Sept. 3-6—Air Force Association National Convention and Aerospace Panorama, Exhibition Hall, Miami.

Sept. 7-13—Annual Farnborough Flying Display and Exhibition, Society of British Aircraft Constructors, Farnborough, England.

Sept. 23-24—Airwork Corp. Engine and Operations Symposium, Millville, N. J.

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CAPTAIN M. NOGUES COMPLETES FIRST SCHEDULED FLIGHT BETWEEN MARSEILLES, SAIGON!

Marseilles, France, February 15, 1931—Captain Maurice Noguès landed his tri-motor Fokker aircraft at La Ciota Airfield today after completing the first scheduled round-trip flight between Marseilles and Saigon, Indo-China. Captain Noguès' exploit marked the culmination of five years of exploratory flights along the route. The service is expected to speed mail, cargo and passengers between Paris

Maurice Nogues

FIRST IN INTERNATIONAL AIR TRAVEL! Since the very beginning of aviation history, men like Blériot, Bossoutrot and Noguès have led the way in international flight. Today Air France continues this tradition of leadership in air transport by offering the most non-stop flights both ways between New York and Paris and the fastest jet service in Europe and the Middle East. Next year Air France plans to cover the world's largest route network with one of the largest fleets of jet aircraft in the world.

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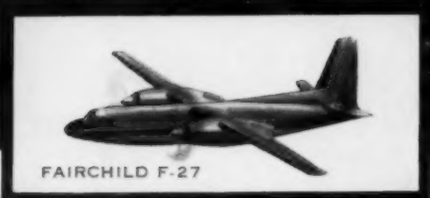
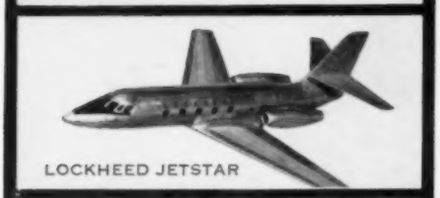

FAIRCHILD F-27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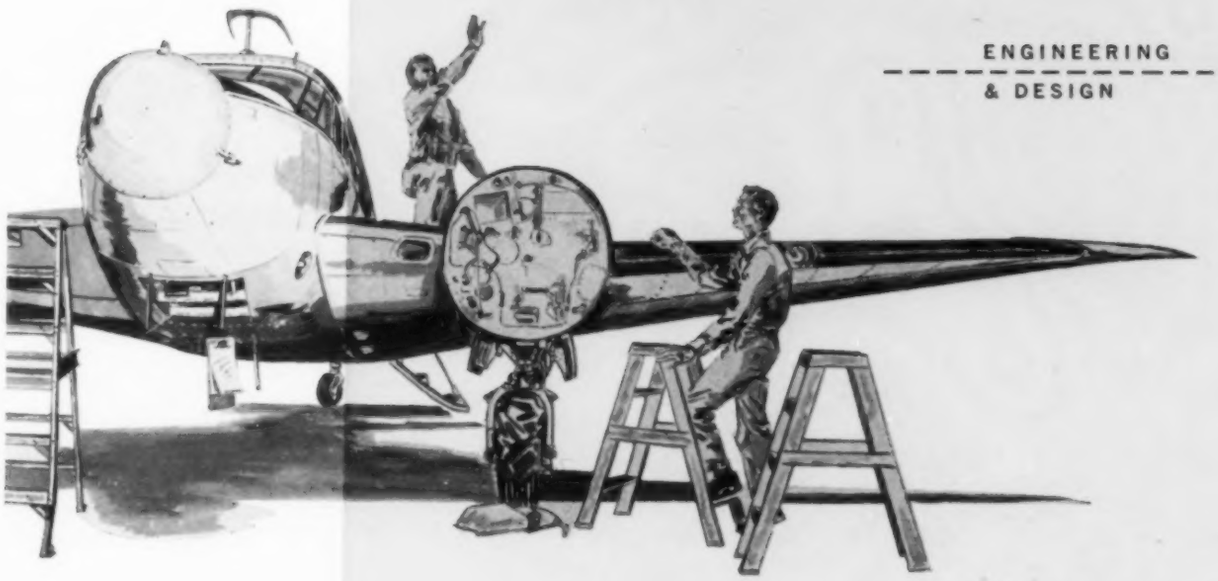

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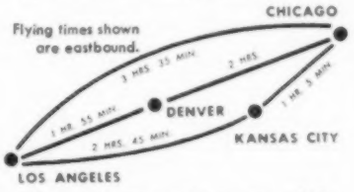
Since only the usual jet surcharge will be added to regular First Class and Club Coach fares, you can fly Coach between Chicago-Los Angeles for $88.55 one way, plus tax. With your meal included! For reservations, call your Travel Agent or any Continental ticket office.

*2nd and 3rd flights effective June 22

**"Gold Carpet" is a service mark owned exclusively by Continental Airlines.

If you live east of Chicago

simply order your tickets from the airline of your choice. Tell the reservation agent you want to ride Continental's Golden Jet from Chicago west. Or, if you prefer, contact your local Travel Agent.



Shown above are the routes of the Golden Jet. First service will be daily non-stops between Chicago and Los Angeles. Later on, service will be extended to Denver and Kansas City, too.

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Answer: "##$#&&%! I'm a fixed base operator. I fish as a **&*$$# hobby."
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Answer: "&!%$#! I believe every man should think for himself. However, if I'd used the same sense in buying this %%$!%#" reel that I use in buying famous-name aviation supplies from Southwest Airmotive, I'd be netting some fish now!"
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Champion Local Service Salesman

PAUL J. Rodgers works for Ozark Air Lines and is listed as public relations man for the company. Since September of 1950 Brother Rodgers has made 800 talks to almost every kind of audience imaginable. As of January 1 his audiences totalled 2,400,000 people and so far this year he's talked to more than 80,000.

We think this fantastic record makes him the all-time champion local service airline salesman, worthy of recognition and special kudos not only by his own field of endeavor but by the entire air transport industry.

FLIGHT MAGAZINE salutes Paul Rodgers on occasion of this Tenth Annual Local Service Airline issue and hopes that somebody in aviation finds a suitable national award for him out of many aviation awards presented each year and an appropriate occasion on which to recognize the kind of go-getter that's contributing so materially to air transportation progress.

For A Single Service

BRIG. Gen. Robert L. Scott, Jr., USAF (Ret.) who became famous in World War II for his book, "God Is My Co-Pilot," recently told the Wings Club in New York that the United States now is in the midst of "the most critical period we've ever faced" and urged creation of a single military service for the defense of the country.

Admitting that the "Department of Defense initially was designed with a wonderful idea," he said it has developed into a welter of assistant secretaries, undersecretaries and deputy secretaries and added: "You can't get much farther than the assistant to the 19th assistant of Secretary McElroy."

Scott admitted his troubles with officialdom during his Pentagon service as head of the Office of Information Services and that he was fired.

Where there's smoke there has got to be fire and it comes as no news that the Pentagon is a difficult place to work and that a veritable army of secretaries and undersecretaries and deputy secretaries effectively walls off the military king pins from the outside world and its realities.

What is news in this instance is that General Scott has the boldness, initiative and alertness to rebel publicly against a defense management system which has become impractical and ridiculously ineffective. Scott may or may not have a remedy which could solve the dilemma. Whether he knows the answer or not isn't as important right now as the fact that he knows the problem. There are enough bright men in our military services who know what's wrong but only Congress can act to correct the mess before it's too late.

Air defense nowadays is a matter of national life or death. The magnitude of this cries out for action to rid the military service of secretarial bulwarks against the realities of defense needs. Pentagon fumblers in and out of uniform are a mortal risk we can not afford to tolerate in this hostile and explosive world. We salute General Scott for his boldness in speaking out against the Pentagon's multiple secretarial system and the methods it uses to foil constructive efforts.

Engine Supercharging

EVERYBODY interested in the development of more efficient airplanes for business use will join us in saluting Aircooled Motors for its pioneering of a turbosupercharged engine for light aircraft. Its new 6-cylinder 225-hp. Franklin engine is announced on page 114 of this issue and will maintain sea level power up to 10,000 ft. In the past we have paid tribute to Lycoming for its effective use of geared superchargers on its 6-cylinder engines.

We have long wondered why engine manufacturers have not utilized supercharging on a wider scale. Turbo blowers are especially valuable, because they avoid the complications and penalties of gears. We know the engine people can offer argument — but the

HONORS FOR 25 YEARS OF SERVICE TO CESSNA AIRCRAFT AND WICHITA were paid to Dwane L. Wallace, president of Cessna, at a special Chamber of Commerce reception in the Kansas aircraft capital last month. Some 400 aircraft industry and community leaders attended. Pictured with Wallace (center) below, left to right, are Brig. Gen. Kenneth O. Sanborn, McConnell Air Force Base commander; Mrs. O. A. Beech, president of Beech Aircraft Corp.; Mr. and Mrs. Wallace, and N. D. Showalter, general manager of Boeing-Wichita.

PIONEERING CANADIAN FLIGHT WAS RELIVED recently when a replica of the Silver Dart, built by the Royal Canadian Air Force, was flown at Baddeck, Nova Scotia. At the controls was Wing Commander Paul Hartman of Ottawa, whose 1959 flight in the replica re-created the first powered flight in Canada on the 50th anniversary of that event. The Silver Dart replica will appear as part of the ground displays at a number of summer exhibitions staged by the RCAF's "Golden Hawks" precision aerobatic team of jet fighters. The team is touring Canada commemorating the RCAF's 35th anniversary.

—(RCAF Photo.)

CESSNA AIRCRAFT PROMOTIONS came last month in an expansion of the factory's corporate management ranks. Del Roskam (right, above) was promoted to a newly-created position as vice president in charge of aircraft divisions. V. G. Weddle (left, above), with Cessna since 1936, was promoted from military aircraft division works manager to general manager of the commercial aircraft division, the post formerly held by Roskam.

—(Cessna Photos.)

fact remains that sea level engines can not contribute as much to airplane performance as altitude engines.

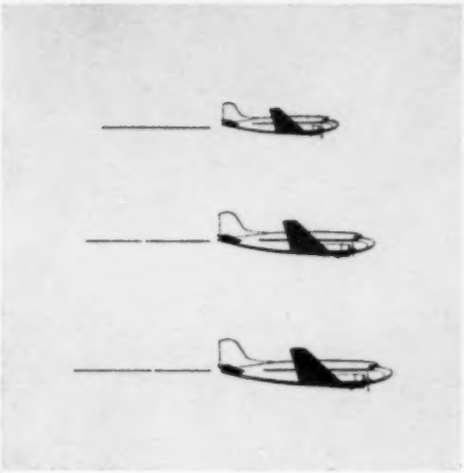
There can't be many mysteries about supercharging — great progress was accomplished with blowers during World War II on large engines. Moreover, turbine progress in large engines since the War has produced important new developments in metallurgy which should make turbosupercharging more practical than ever. Everybody who ever used a private airplane for transportation has longed for some means of maintaining power up to 10,000-12,000 ft., instead of running out of throttle half way up to cruising altitude. With a sea level engine, the efficiency of altitude and its performance advantages are never available.

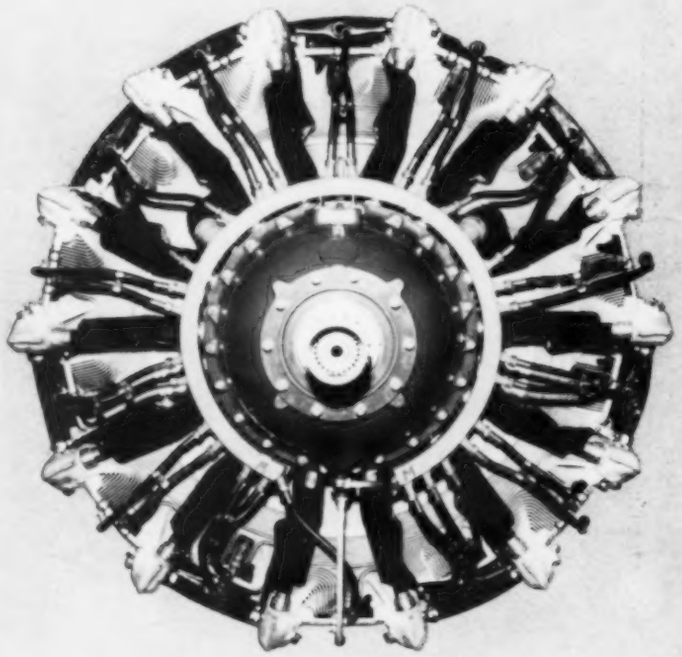
It's simpler and easier and less costly to equip the airplane with a larger sea level engine. But there are customers who can afford supercharging and who believe the extra performance at altitude will more than pay for its extra costs. Supercharged Lycomings are available on twin-engine business planes and their acceptance has justified their development and production. However, 340 hp. is currently as high as a customer can go in his choice of American business planes with new-production engines. All aircraft design progress stops right there in business planes grossing up to 9,000-odd pounds.

As for the more numerous people who use single-engine airplanes, no modern engine supercharging is available to them at any price. This obvious gap in aircraft and engine progress should stimulate development. The engine companies may say that customers won't pay the costs, but we don't believe that argument can last forever. A 40-lb. penalty in engine weight will prove acceptable to enough customers to justify the installation of turbosupercharged engines in business planes, and the extra performance at 10,000 to 12,000 feet will pay for the extra costs involved.

REVIVAL OF MARKET FOR 2-PLACE LIGHT PLANES has brought new demands for the improved Luscombe Silvaire, now being produced by Silvaire Aircraft of Ft. Collins, Colorado. Reading Aviation Service at Reading, Pa., has signed up for a 13-state Luscombe distributorship and describes the improved all-metal, 90-hp. Silvaire as selling for less than $5,000 and offering 120-mph. cruise and range of over 500 miles on 25-gal. fuel capacity.

DAS overhauled engines provide dependable power for LOCAL SERVICE AIRLINE FLEETS serving 108 cities in 14 states





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SOUTHERN AIRWAYS, INC.

Keeping pace with the industrial growth of the deep South, Southern Airways penetrates key markets in North Carolina, South Carolina, Tennessee, Georgia, Alabama, Mississippi, Louisiana and Florida and provides regular flight schedules permitting commuter inter-city travel.

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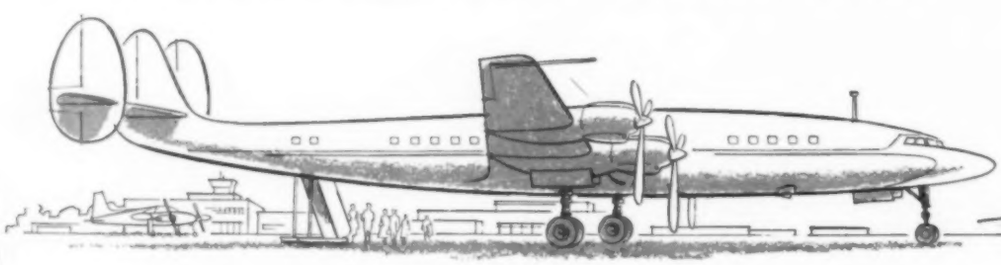

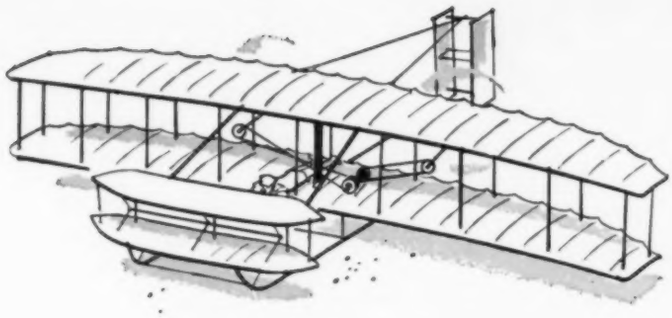

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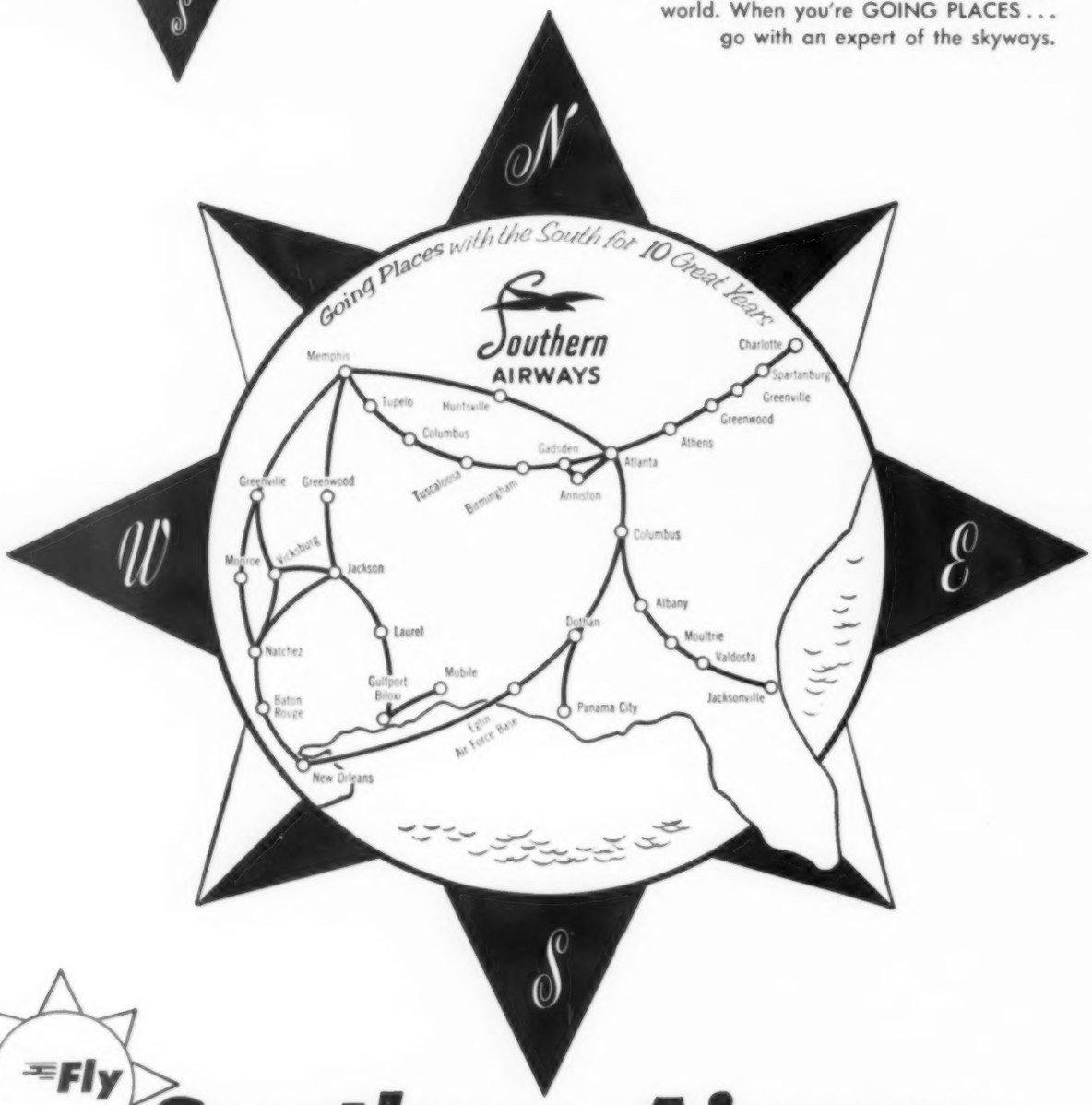

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CONTINENTAL'S VISCOUNT NET PROFIT $1.3 MILLION IN FIRST 7 MONTHS!

With an average fleet of nine* new Viscount 810 (Viscount II) jet-props, Continental Airlines recently reported a net profit of $1.3 million. Direct cost per plane mile was 71.33 cents—nearly 11 cents below budget. These figures confirm those for the first four months of Viscount operation which showed that, with a break-even load factor of only 37.3%, the Viscount was easily the most economical to operate of Continental's aircraft.

Mr. Robert Six, President of Continental, paid tribute to the Viscount's major contribution in the airline's $1 million operating profit for the fourth quarter of 1958. And he looks forward to 1959 as "the best year in the airline's 25-year history."

BOARDINGS UP 90% IN CHICAGO

The popularity of Continental's Viscounts played a leading part in boosting the airline's 1958 boardings 90% in Chicago—and 67% in Los Angeles.

Mr. Six has high praise for the Viscount. He reports that "Performance, passenger appeal and economies of the Viscount II have exceeded all expectations. The public has shown great response. The Viscount II is ideally suited for medium-length distance and pilots have shown a great enthusiasm for its handling qualities."

For further information on the bigger, faster new Viscount II, contact Christopher Clarkson, U.S. representative, 10 Rockefeller Plaza, New York 20, N. Y.

*Continental's Viscount II fleet average was nine for the 7-month period ending December 31, 1958. Delivery of the airline's total order of 15 new Viscounts is now complete.

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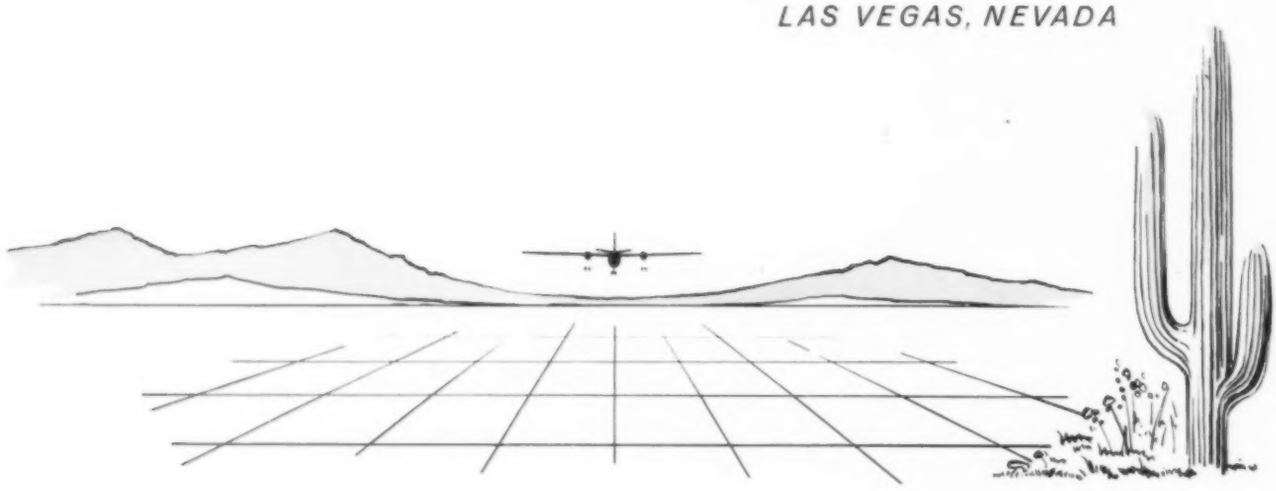

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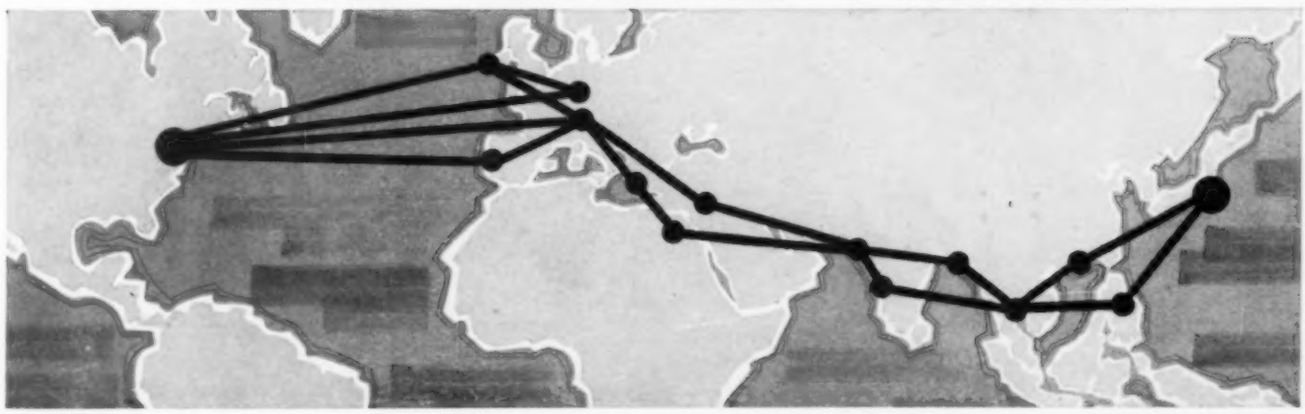

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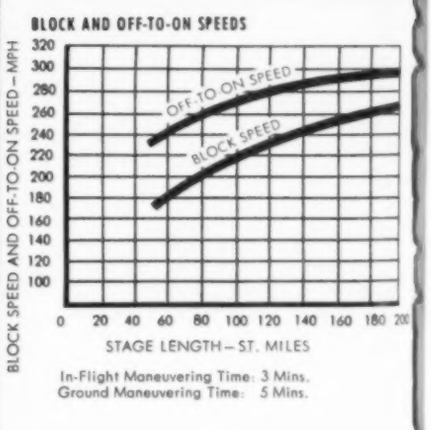

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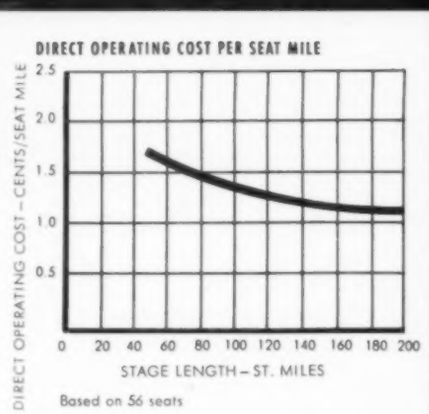
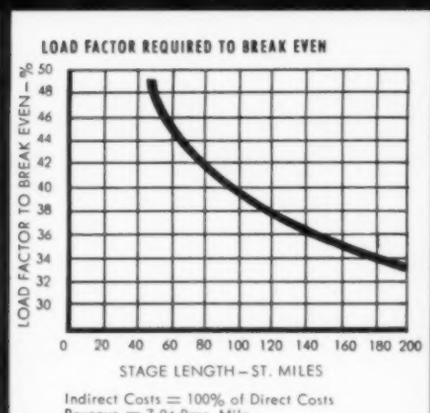
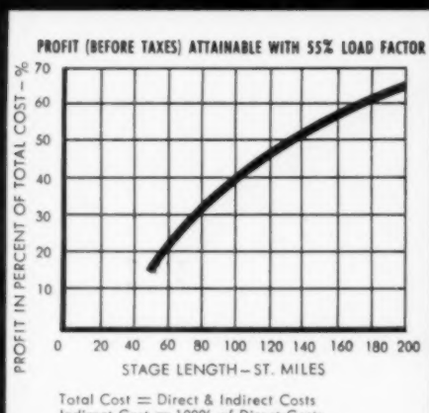


Based on 56 seats



Indirect Costs = 100% of Direct Costs
Revenue = 7.0¢ Pass. Mile
56 Seats
No Cargo Revenue



Total Cost = Direct & Indirect Costs
Indirect Cost = 100% of Direct Costs
Revenue = 7.0¢ Pass. Mile
56 Seats
No Cargo Revenue

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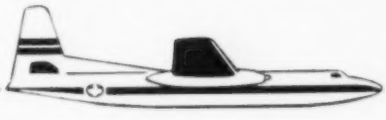

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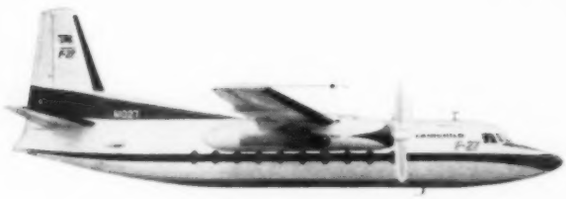

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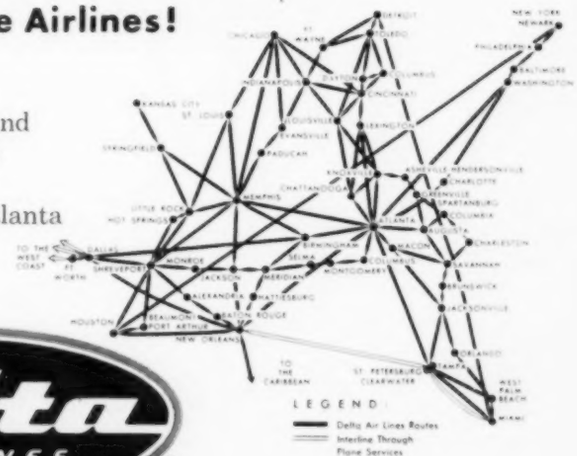

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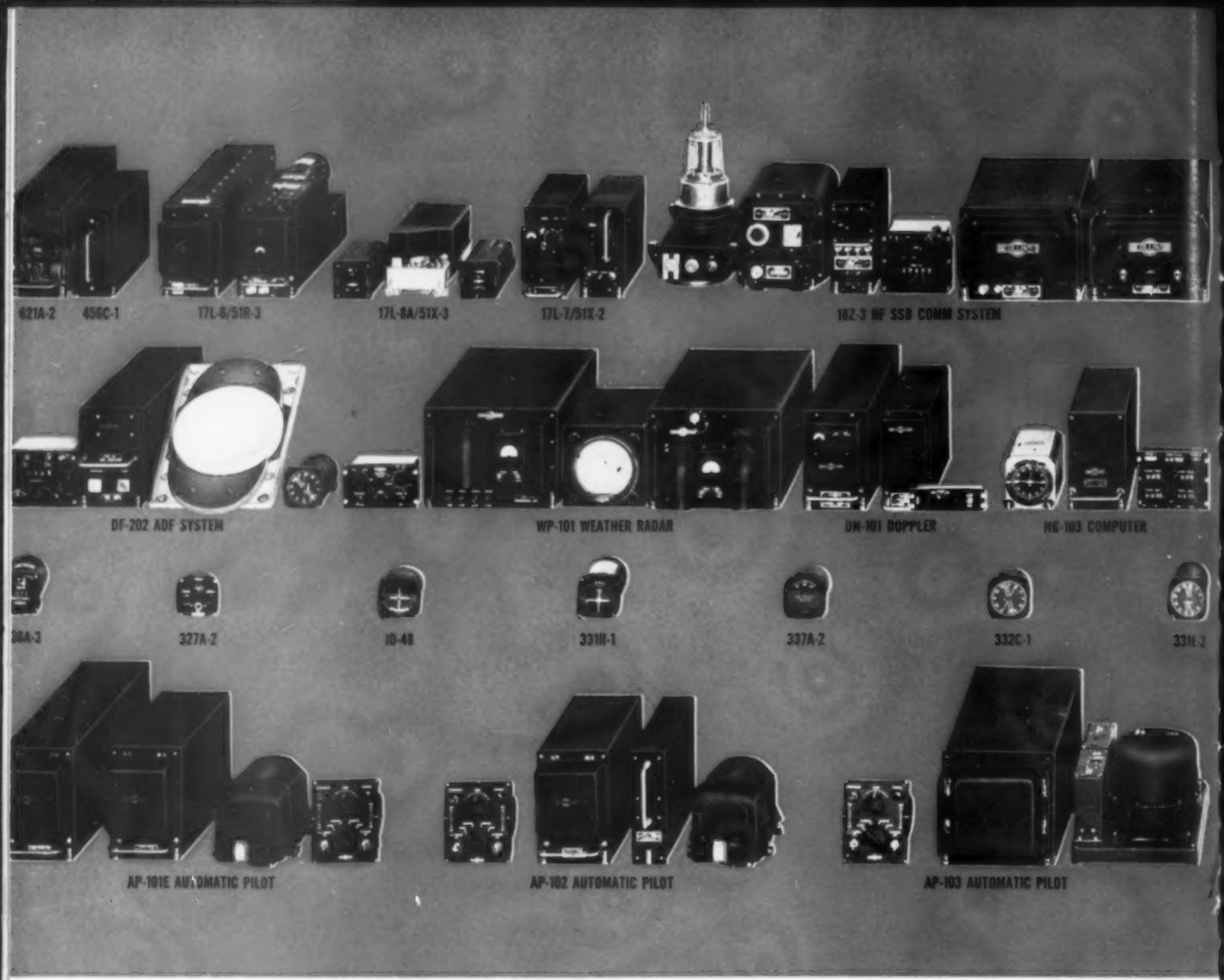

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621A-2 TRANSPONDER — Reinforces radar replies to ATC radar beacon. Side lobe suppression limits response to main lobe of radiation pattern. Ceramic disc-seal transmitting tube. 1/2 ATR case. Transponder wt. 26 lbs.

456C-1 SELCAL — Twelve resonant reed relay assemblies in each of two channels in 3/8 ATR short case. Switches on front panel ease code selection. Selcal wt. 10.25 lbs.

17L-4, -6/51R-3 VHF COMM SYSTEM — Transmitter has 360 channels, 118-135.95 mc, 50 kc spacing, 25 watts output. 51R-3 provides 280 channels, 100 kc spacing, 108.0 to 135.9. System wt., approximately 65 lbs.

17L-8A/51X-3 VHF COMM SYSTEM — Lightweight 3 watt 90 channel transmitter, 180 channel receiver and power supply. Crystal controlled. 17L-8A tunes from 118.0-136.9; 51X-3 from 108.0-126.9. 100 kc increments. System wt 10.75 lbs.

17L-7/51X-2 VHF COMM SYSTEM — Airline standard. 17L-7 provides 25 watts output on 680 channels between 118.0 and 151.95. 51X-2 reception on 880 channels between 108.0 and 151.95 kc, 50 kc spacing. Crystal control. System wt. 27 lbs.

18Z HF SSB COMM SYSTEM — Fully automatic SSB communication on 28,000 channels, 2-30 mc in 1 kc steps. 1 kw PEP. System includes Receiver-Exciter, Power Amplifier, one or more Remote Controls. Antenna couplers available.

618T HF SSB COMM SYSTEM — Fully automatic SSB communication on 28,000 channels, 2-30 mc in 1 kc steps. 400 watts PEP. System wt. approximately 50 lbs.

185-4 HF COMM SYSTEM — Self contained transmitter-receiver. Has associated automatic tuner. Up to 20 crystal controlled channels, 2-18.5 mc with 100 watt output.

618S HF COMM SYSTEM — Transceiver offers up to 144 crystal controlled channels in 2-25 mc range. 100 watt output. Has associated antenna tuner and power supply.

346A-1 INTERPHONE AND ISOLATION AMPLIFIER — Provides interphone, isolation and speaker amplifier functions. Wt. 7 lbs.

346D-1 PASSENGER ADDRESS AMPLIFIER — Transistorized high fidelity amplifier. Inputs for pilot, stewardess and tape reproducer. Multiposition tone control. Wt. 9.6 lbs.

NAVIGATION

DF-202 ADF SYSTEM — Includes 51Y-3 Receiver. Silicon diodes, dry disk rectifiers and transistors hold tube count to 11. Digital frequency presentation on Remote Control. Tunes 90 to 1800 kc in four bands. Flush or semiflush mounted antenna. Integral power supply. System wt. approximately 31 lbs.

WP-101 WEATHER RADAR — Pulse modulated operation in the C-band 5400 mc frequency range. Ranges, 20, 50, and 150 miles. Bright tube indicator allows daylight viewing without hood. Offset sweep presentation.

DN-101 DOPPLER RADAR NAVIGATION SYSTEM — FMCW SSB techniques used to enable operation from 0 to 50,000 ft. Effective operation over smooth seas. Provides continuous indication of drift angle and ground speed. Dual system operates from single antenna. Equipment can be ground tested. Low power consumption. System wt. approx. 65 lbs.

NC-103 DOPPLER NAVIGATION COMPUTER SYSTEM — Processes DN-101 ground speed, drift angle and compass inputs and presents along-track and across-track information to a panel-mount control panel. Supplies output data to course line deviation indicator, distance display and automatic pilot. System wt. 23 lbs.

VOR-101 VHF NAVIGATION SYSTEM — 51X-3/344B-1 combine to provide 880 channels with 50 kc spacing between 108.0 and 151.95 mc. Visual localizer, omnicourse, glide path to-from, OBI and RMI outputs in addition to voice reception. System wt. 24.5 lbs. Integral power supplies.

VOR-102 VHF NAVIGATION SYSTEM — 51X-3/344A-1 combine to provide same service as VOR-101 except no RMI service in avail[able] 3/8 ATR short and 1/4 ATR short cases. System wt. 19.5 lbs. Integral power supplies.

51X-3/344A-1 VHF NAVIGATION SYSTEM — Lightweight deluxe navigation system with all services except RMI. System wt. 17[.5] lbs.

51X-3/344D-1 NAVIGATION SYSTEM — Two panel mounted 3" cases provide VHF receiver and left-right VOR/LOC indication, radio[-]bearing, to-from information and VOR course selection. Associated power supply with [in]cluded shockmount. System wt. 13.15 lbs.

Ever since the early days of commercial aviation the prestige of Collins communication and navigation equipment has thrived, nourished by an energetic research and development program dedicated to the advancement of aviation electronics. The result is evident on these pages – the most complete line of high quality avionics equipment bearing one trademark. And even this group portrait is incomplete, lacking the scores of servos, remote control units, shock-mounts and test equipment associated with the major systems pictured. The Collins name is as important in military as it is in commercial aviation. In addition to the Collins communication and integrated electronics systems serving jet fighter and bomber squadrons throughout the world, Collins airline type equipment is widely used aboard military transports.

avionics

COLLINS

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VHF NAVIGATION RECEIVER — Utilizes plug-in vame modules and provides the same service as the VOR-101. 1/2 ATR case offers optional size for identical service. Wt. 25 lbs.

DME — Provides precise distance information for aircraft up to 200 nautical miles from associated ground beacon. Provides 1 kw min. peak pulse power. Wt. 35 lbs.

MARKER BEACON RECEIVER — One or two light and aural indication of passage over 75 mc marker beacon. Completely transistorized. 2-light version, wt. 4.9 lbs.

GLIDESLOPE RECEIVER — Motor driven crystal switch for frequency selection of 20 channels between 329.3 and 335.0 mc. 10 channel version is available. Flag alarm circuit included. 1/4 ATR short case. Wt. 6.3 lbs.

MAGNETIC COMPASS SYSTEM — Lightweight gyro-stabilized compass with output to drive an automatic pilot, flight director, Doppler and other navigation systems. System wt. 13.8 lbs.

INSTRUMENTATION

OMNI-BEARING SELECTOR — Enables selection of desired track and provides to-from information. Wt. 2 lbs.

MARKER LIGHT INDICATOR — Contains three press-to-test lights and Hi-Low sensitivity switch. Wt. 0.63 lbs.

DEVIATION INDICATOR — VOR/ILS displacement data. Flag service. Wt. 1.9 lbs.

COURSE SELECTOR INDICATOR — Provides cross-pointer, to-from, flag and digital course selector service. Wt. 4.0 lbs.

OMNI-BEARING INDICATOR — Presents true bearing to VOR station and drives RMI pointers. Wt. 2.5 lbs.

RADIO MAGNETIC INDICATOR — Dual input for VOR or ADF. Provides heading and omni or ADF bearing. Wt. 2 lbs.

ADF INDICATOR — Similar to 332C-1 indication except no magnetic heading indication. Variation set knob sets card. Wt. 1.5 lbs.

ANTENNAS

VOR NAV ANTENNA — Receives VOR and LOC signals in the 108-122 mc range. Drag of 2.6 lbs. at 250 mph. Wt. 4 lbs.

VHF COMM ANTENNA — Receiving and transmitting antenna with maximum input capability of 125 watts. Frequency range: 116-152 mc. Drag of 0.5 lbs. at 250 mph, 1.3 lbs. at 400 mph. Wt. 2 lbs.

VHF COMM ANTENNA — Receiving and transmitting antenna in 118-136 mc frequency range. Drag is 1 lb. at 250 mph. Wt. 3.5 lbs.

-4, -5 GLIDESLOPE ANTENNA — Accepts glideslope signals in the 329-336 mc range. Negligible drag. 37P-5 has two inputs for dual glideslope receiver installation. Wt. 0.7 lbs.

VHF COMM/NAV ANTENNA — Combined unit for communication from 118 to 136 mc and navigation from 108.8 to 127.8 mc. Drag of 15.3 lbs. at 600 mph. Wt. 4.7 lbs.

MARKER BEACON ANTENNA — Receives 75 mc marker beacon signal. Drag of 3.5 oz. at 400 mph. Wt. 1 lbs.

FLIGHT CONTROL

AUTOMATIC PILOT — Provides automatic pilot services in the heavy turbo to four engine airliner range. Flies the aircraft in response to heading signals during cross country and localizer-glideslope signals (including crosswind correction) during approach.

AUTOMATIC PILOT — Lightweight automatic pilot with services and installation range similar to the AP-101E.

AUTOMATIC PILOT — Collins newest version automatically controls all high performance commercial and executive aircraft including airline and executive jets. Offers continuous radio course crosswind correction, smooth flight over VOR stations, included flight director steering computer circuitry.

INTEGRATED FLIGHT SYSTEM — Provides instrumentation for attitude control, flight along selected headings or VOR radials. ILS approaches and flight director steering. Complete plan view and forward view picture of flight is presented on two instruments.

INTEGRATED FLIGHT SYSTEM — Advanced version of IFS with two-color horizon background, 4" instruments, integrated lighting and larger warning flags.

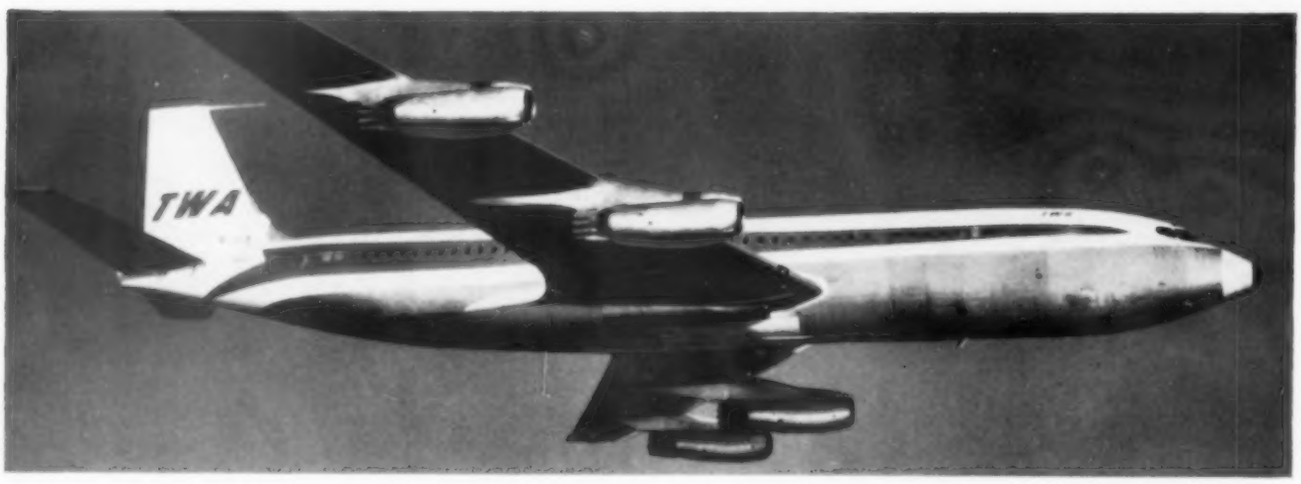
INTEGRATED FLIGHT SYSTEM — Lightweight IFS utilizing 3" instruments of the FD-104. Computer amplifier in a 1/4 ATR short.

REPORT ON OPERATIONS

IN SERVICE, the Boeing 707 has set record after record, both for performance and passenger appeal. A Los Angeles to New York passenger flight was made in 4 hours, 3 minutes. During the first 60 days of this service, the 707 averaged a load factor of more than 95%, an unprecedented high in passenger appeal.

RESERVATIONS in the thousands for flights months ahead have poured in. A noted aviation writer reports: "The tremendous public acceptance of the 707s and their great revenue-producing ability have been among the most significant commercial-aviation developments since the Second World War."

THE 707 has broken all trans-Atlantic airliner records, flying New York to Paris in 6 hours, 4 minutes, and New York to London in 5 hours, 41 minutes. 707 passenger loads to Europe have been at record levels averaging a winter load factor of 94%. In addition, 707s carried up to 5 tons of mail and cargo each flight. Boeing jets are profit-making jets. Seventeen airlines have ordered a total of 190 Boeing jetliners—a reflection of confidence in Boeing, the world's most experienced builder of multi-engine jet aircraft.



707s NOW LINK San Francisco to New York in 4 hours, 50 minutes. Here again, 707s have set new records for speed and passenger appeal. Later this year, Boeing 707 jetliners will go into service over the domestic and overseas routes of Continental, Qantas and Braniff airlines.

BOEING
Family of jet airliners

These airlines already have ordered Boeing jetliners: AIR FRANCE • AIR INDIA • AMERICAN • B.O.A.C. • BRANIFF • CONTINENTAL • CUBANA • IRISH • LUFTHANSA • PAN AMERICAN • QANTAS • SABENA • SOUTH AFRICAN • TWA • UNITED • VARIG • *Also* MATS

Curtiss-Wright powered helicopters bring "local service" to the heart of town

With airports moving farther out . . . and large cities having more and more points of departure . . . the helicopter has become increasingly important in assuring air travelers the full advantages of jet age speeds.

To provide this short range "commuter service" dependably, leading helicopter manufacturers and operators rely on Curtiss-Wright engines. Such widely used models as the Sikorsky S-58 and the Vertol H-44 are powered by the Curtiss-Wright Cyclone 9 engine. In addition, Curtiss-Wright makes Automatic Throttle Controls that give helicopter pilots a "third hand" . . . keep engine speed constant and guard against overspeeding.

In flights between city centers and airports, in military applications, in rescue and supply work . . . helicopters with compact, powerful Cyclone 9 engines serve in vital jobs for government and industry today.

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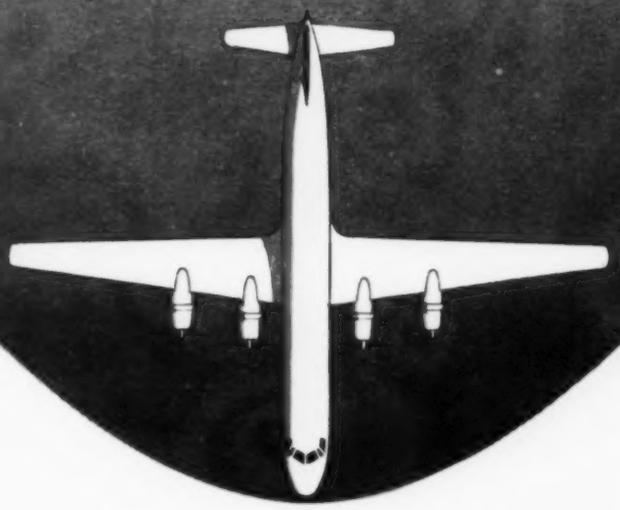
fly **FRONTIER AIRLINES**

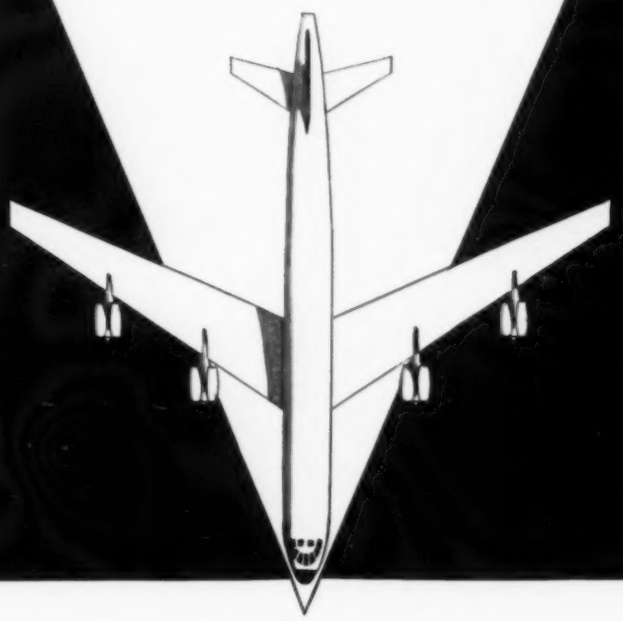
Sinclair

supplies 45% of the aircraft oil used by major scheduled airlines in the U.S.



Sinclair

aircraft oil is also used to lubricate the mighty engines of commercial and military jets



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Aircraft Oils

Sinclair Refining Company, Aviation Sales, 600 Fifth Avenue, New York 20, N. Y.

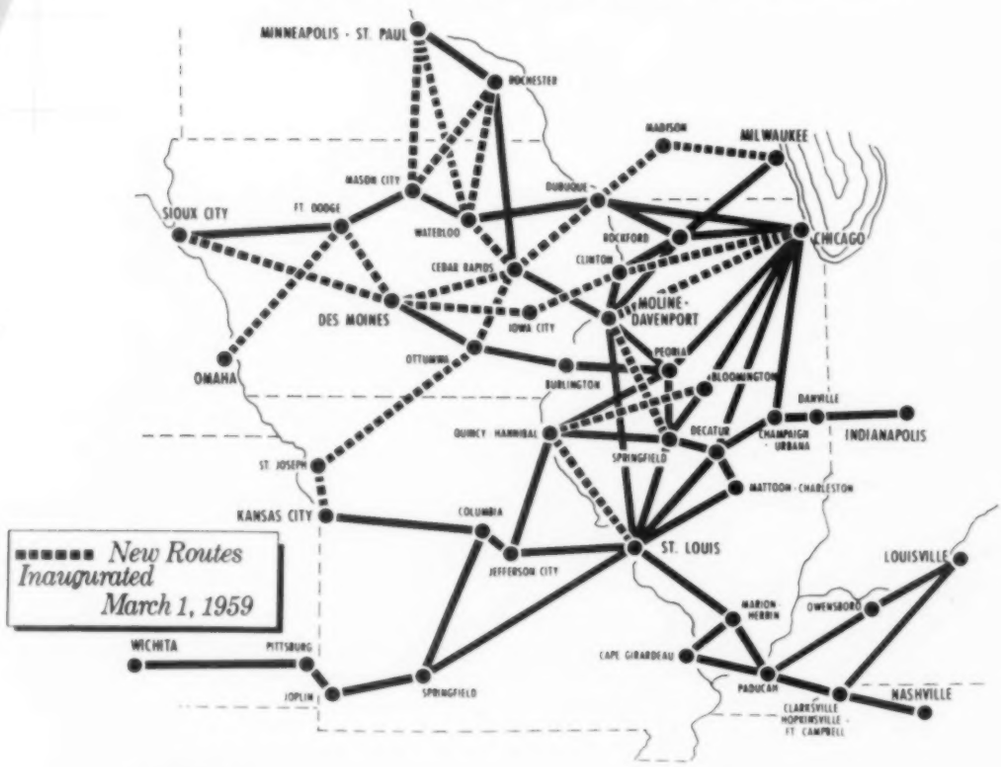
45.7% INCREASE

IN FLIGHT OPERATIONS THIS YEAR!

OZARK EXPANSION

Adds Important New Service in 10-State Area

Ozark now serves 52 cities over 5,273 route miles throughout the Midwest . . . flying more than 9,000,000 scheduled miles and carrying over 600,000 passengers annually.



OZARK AIR LINES

The Businessman's Air Line
General Offices: Lambert Field, St. Louis, Missouri

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"For your extra comfort, United has the nation's largest airline weather center, keeping us posted at all times as to where the best weather is," says veteran Captain Guy E. Cain. "Besides, radar on every plane 'X-rays' the sky up to 150 miles ahead day or night, showing us the smoothest path for your on-time arrival. And for the past five years United Air Lines has been studying the best high-altitude routes for your travel soon on Douglas DC-8 Jet Mainliners®." When you fly United, the regular fare buys *extra care* in every way.

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BONANZA DEMANDS
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it with a CANARI package installation

Most of Bonanza Air Lines' routes cross the major East-West airways. Thus, their operations require the utmost precision in navigation and communications.

To meet their demands, Bonanza Air Lines selected Wilcox CANARI Equipment for its pin-point accuracy and proven reliability.

Bonanza Air Lines has achieved an enviable safety record. They are sure to maintain it with their F-27 Silver Dart jet-prop fleet equipped with Wilcox CANARI navigation and communications system.

For more detailed information about the advantages of installing Wilcox CANARI equipment in your aircraft . . . whether for commercial or business operations . . . write, wire or phone . . .

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Fourteenth & Chestnut Sts., Kansas City 27, Mo., U. S. A.

Six Reasons Why You Should Choose wilcox

- Highest accuracy
- Proven reliability
- Simplified maintenance
- Compact size
- Lightweight
- Low cost

CONVAIR STOCKS 18,000 CONVAIR-LINER PARTS!

COMPLETE PARTS FABRICATION FACILITIES FOR ALL MODELS OF THE CONVAIR-LINER SERIES HAVE BEEN PRESERVED

More than 18,000 different parts for the model 240, 340, and 440 Convair-Liners are constantly in stock at Convair San Diego. This stock includes parts made or designed by Convair, and parts to which Convair has sales rights. While Canadair is building the turboprop 540 in Montreal with some of the tools formerly used to build the Convair 440, parts are made with these tools and shipped to Convair San Diego for stocking as 440 spares.

Parts are available on a 24-hour basis and will be shipped to buyers by any desired method of transportation. A stock catalog, with prices, may be requested by operators and maintenance firms. Information also is available as to where any non-stock item may be obtained.

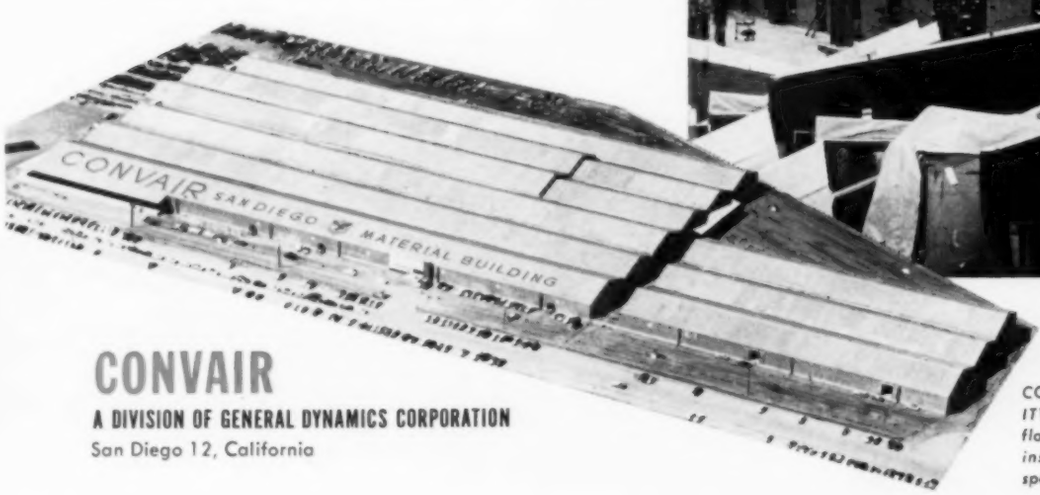
In addition to parts, all the familiar support services upon which Convair-Liner operators depend have been kept intact in Convair's transition from production of propeller-driven aircraft to jet airliners of the 880 and 600 series.

For your convenience and file, the following contacts at San Diego, California, are listed:

SPARE PARTS: Office of Chief of Service Parts. Telephone CYpress 6-6611, Ext. 1640, or ACademy 2-6351, Ext. 11 or 12.

TECHNICAL & TRAINING: Office of Chief of Transport Service. Telephone CYpress 6-6611, Ext. 2631 or 2632.

READY FOR SHIPMENT—High stock levels of all critical Convair-Liner parts.



CONVAIR'S NEW PARTS FACILITY—500,000 square feet of floor space devoted to receiving, inspection, commercial stores, spare parts and materiel service.

CONVAIR

A DIVISION OF GENERAL DYNAMICS CORPORATION

San Diego 12, California

NEWEST MEMBER IN A FAMILY OF GREATS

The Canadair-Convair '540', by the application of turbine power, becomes the ultimate development of the widely used and approved Convair 240-340-440 series. The '540' is now on order and in full scale production, and is currently being demonstrated to airlines and business aircraft owners throughout North America.

6 MAJOR REASONS

why the '540' is the new challenger on short-to-medium routes!

1 DEFINITELY LOWER OPERATING COSTS

The standard 48-seat Canadair-Convair '540' offers **a direct operating cost of 1.4¢ per seat mile which comes down to 1.1¢ in the 58-seat configuration.** Over distances as short as 80 miles, its economy of operation matches even that of piston-engined aircraft.

2 GROWTH CAPACITY TO MEET GROWING ROUTE DENSITIES

The Canadair-Convair '540' has the built-in capability of growing with the increased traffic densities that are forecast for the years ahead. It can do this because its **seating capacity can be increased by 20%** from 48 to 58 **without weight or operating penalty.** All fuel for terminal-to-terminal operation could still be carried.

3 MATCHED-TO-TASK JET-PROP ENGINES

The Napier 3500 e.h.p. engines that power the Canadair-Convair '540' are **the only jet-props specifically designed for the particularly strenuous up-and-down life of short stage operations.** The sectionalized design of these powerful new engines make them singularly easy to service and maintain.

4 REDUCED EN-ROUTE GROUND TIME LOSSES

The Canadair-Convair '540' **eliminates numerous possible time delays at en-route stops:** passenger handling is expedited . . . time consuming engine warm-ups are unnecessary . . . as many as 6 route stops can be made without refuelling.

5 FASTER FLYING, QUICKER CLIMBING

Today's passengers want to **make time.** The Canadair-Convair '540' is **the fastest aircraft in its class,** flying at speeds up to 340 m.p.h. It's off the ground in a flash and takes only 6.4 minutes to climb to an operating level of 10,000 feet.

6 EXTRA CARGO SPACE FOR EXTRA PROFITS

The Canadair-Convair '540' has 402 cubic feet of easily accessible cargo space: enough for **two tons of additional payload** that can be carried with no operating penalty.

MOST IMPORTANT TO YOU

The "540" is a product of Canadair which, as a member of the General Dynamics family of companies, is associated with the following corporate divisions that constitute this important enterprise and represent it in its many exciting fields of activity: Convair, for the Atlas satellite and missile programme; Electric Boat, for atomic-powered submarines; Stromberg-Carlson, for nuclear instrumentation; General Atomics, for Triga research reactors; Liquid Carbonic, for production of industrial and medical gasses; and Electro-Dynamics, for the production of electro-mechanical control equipment.

Your request for detailed information on the Canadair-Convair 540 will receive our immediate attention: contact the Director of Commercial Sales, P. O. Box 6087, Montreal.

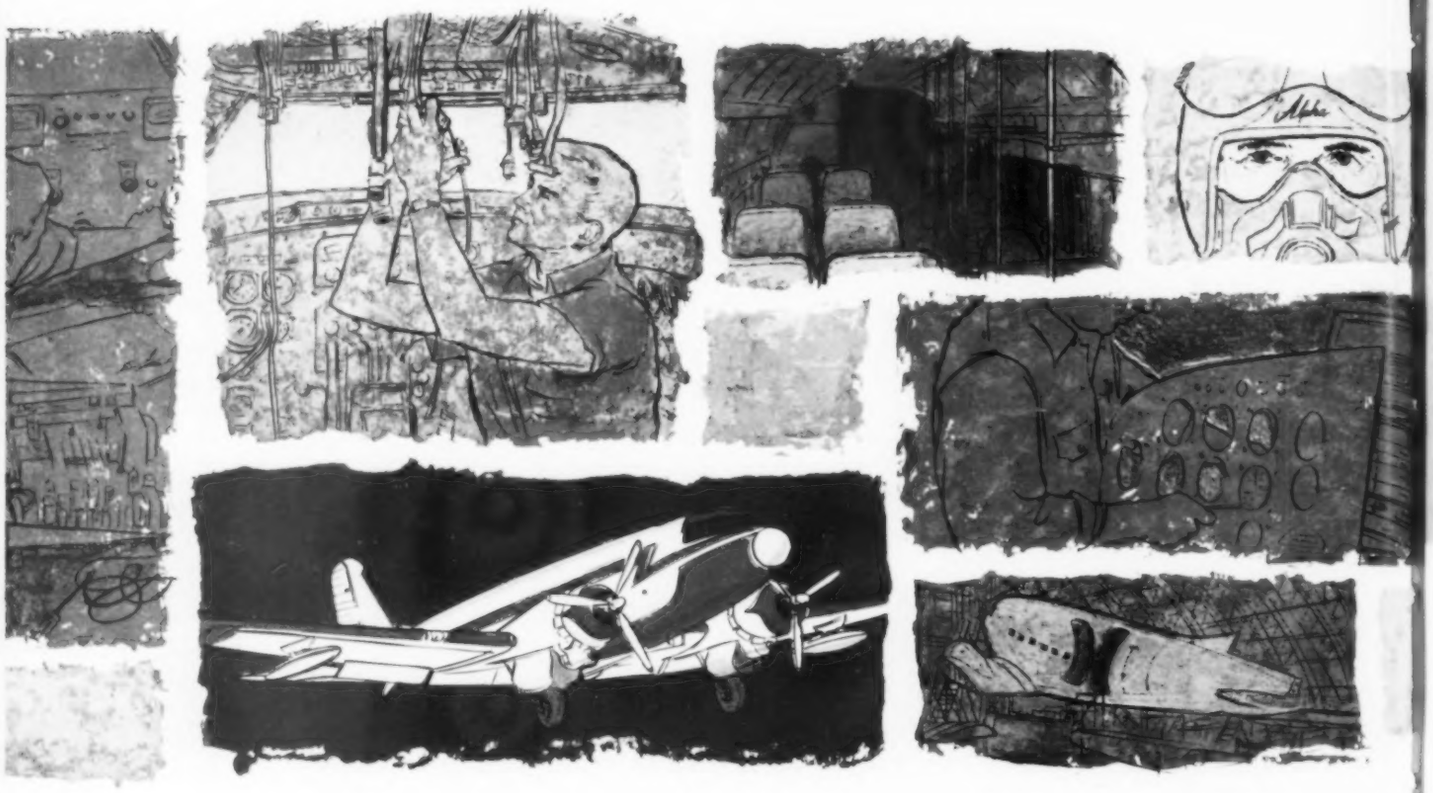
CANADAIR CONVAIR 540

JET-PROP AIRLINER

CANADAIR, MONTREAL, CANADA

THE CANADIAN SUBSIDIARY OF GENERAL DYNAMICS CORPORATION CA59-540-22UST

AIRCRAFT MODIFICATION



ALPHA MODIFICATION CENTER OFFERS COMPLETE SYSTEMS MANAGEMENT RESPONSIBILITY

One of the time-saving, packaged systems project services offered by Alpha Corporation is tip-to-tail modification of aircraft for both industry and government . . . in this country and abroad.

Whether you require the addition of simple or complex electronic equipment . . . or complete redesign and overhaul, including custom interior, Alpha Corporation Modification Center specialists will deliver a flight-tested, turnkey job to your specifications.

A notable example in the aircraft modification field is "Project Shirley" . . . a contract awarded Collins Radio Company by the United States Army Signal Corps. Starting with six surplus R4D aircraft (Navy versions of DC-3's) the airframes were reconstructed to meet exacting requirements imposed by the installation of extra complex electronic assemblies. Further, interiors were redesigned for extreme flexibility . . . including accommodation of seating or extensive airborne test equipment. These versatile "flying laboratories" exemplify the kind of complete, turnkey jobs Alpha handles at its Air Modification Center. Further, Alpha fabricates specialized equipment and installs it on client aircraft all over the free world.

Alpha was formed to extend and broaden the types of systems management work done for years by Collins Radio Company. This includes design, engineering and installation of space age communication systems complete with related roads, buildings and towers. The best available equipment from industry is used. Alpha trains client personnel or furnishes skilled crews for finished projects where needed.

Alpha . . . with its highly specialized organization of designers, engineers, scientists and constructors . . . is the sound, dependable answer to the need for proven skill with complete systems management responsibility.

Alpha CORPORATION
A SUBSIDIARY OF COLLINS RADIO COMPANY

DESIGNERS, ENGINEERS, CONSTRUCTORS, WORLD-WIDE • RICHARDSON, TEXAS • TELEPHONE DALLAS ADams 5-2323 • CABLE ADDRESS: ALPHA DALLAS

Alpha capabilities include technical systems management in all fields, with special emphasis on: • Space vehicle tracking and communication • Test range instrumentation and communications • Voice, teletype and data transmission • Aircraft modification and overhaul • Integrated shipborne, airborne, and ground communications • High capability remote control and switching

Healthy Local Service Airlines

An Editorial

NO phase of U. S. domestic aviation is more occupied with more problems and succeeding in spite of them as are the Local Service Airlines, which flew 4,583,656 passengers 73,555,127 miles in and out of 516 cities and towns in 1958 for another new record.

Students and observers of local air service never cease to be amazed at the phenomenal growth statistics chalked up each year by these hardy entrepreneurs, who are just now beginning to move out of the red ink columns into the black. At least one of the carriers last year paid a dividend, three more went into the black, and one of these phased in new Fairchild F-27 equipment while doing so. More began replacing DC-3's with F-27's and Convairs.

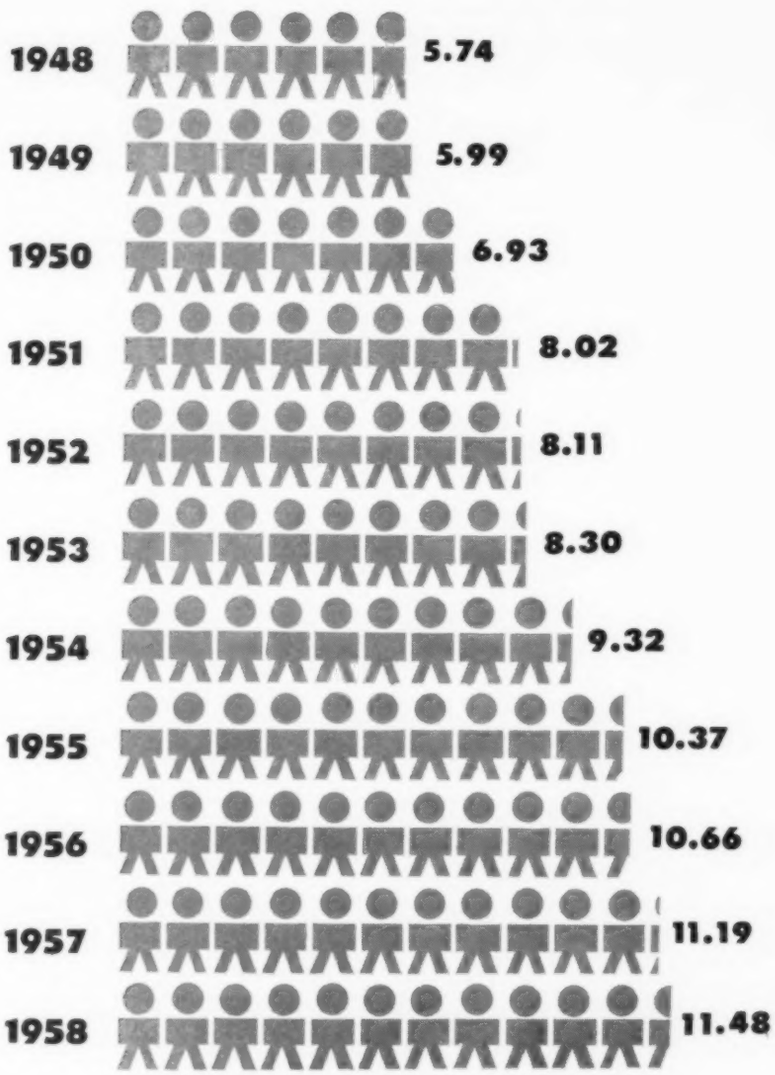
In this, FLIGHT MAGAZINE's Tenth Annual Local Service Airline Edition, we are proud to present last year's accomplishments in this growing field of air transport in the statistical perspective of previous years. The year 1958 was highlighted by substantial gains in all departments. Perhaps the most significant aspect of local air service is the addition of new aircraft to the carriers' fleets, principally the turbine-powered F-27 and Convairs. The immediate jump in load factors that resulted from the use of these new airplanes proves beyond a shadow of a doubt that the market is there and it's going to take modern equipment to get the business.

The trunk airlines are giving up more and more intermediate points to the locals as it becomes more and more apparent that many communities served by the trunks can get better service from the locals.

The Civil Aeronautics Board, in pushing the "use it or lose it" formula to the subsidized towns, might well be paving the way for a third level of scheduled air transportation — a subsidized level as the present locals gain self-sufficiency and depart from the original local service concept.

Congressional interest is still high in expanding our whole air transport system.

This Tenth Annual Local Service Airline edition is presented with the hope that the information and interpretations herein might serve as a stimulus for even greater growth and progress in short haul air transportation in the years to come.



Average Revenue Passenger Load Per Year for Local Service Airlines

Locals In Position To Progress

By GEORGE E. HADDAWAY

THIS is the tenth year in a row that FLIGHT MAGAZINE has devoted practically an entire issue to an annual summary and study of our domestic local service airlines.

In our 1956 edition we documented this industry's first year of operations under permanent certificates of convenience and necessity. As most everyone will remember, the locals had previously struggled with temporary certificates and were caught in the impossible position of having to run a legitimate and orthodox transportation system without benefit of orthodox methods of financing. Nobody wanted to put money into an enterprise that may or may not be in operation a few years ahead.

Congress changed all that by ordering a reluctant Civil Aeronautics Board to provide the permanent certificates and last year went a step further by passage of legislation which gives each carrier a 90 per cent government loan guarantee of up to $5,000,000 for the purchase of more modern aircraft. The effects of these two historic pieces of legislation are now apparent. The locals are in a stronger position financially and for

Local Service Airline Growth, Revenues Years 1945 through 1958

Year	Passenger Amount	Passenger % of Total	Total Non-Mail Amount	Total Non-Mail % of Total	Mail Pay Amount	Mail Pay % of Total
1945	$ 64,701	45.0	$ 65,874	45.8	$ 77,890	54.2
1946	314,638	29.2	348,903	32.4	728,179	67.6
1947	2,280,124	27.6	2,468,397	29.9	5,795,932	70.1
1948	4,666,549	32.9	4,996,550	35.2	9,207,621	64.8
1949	7,355,366	35.0	7,876,031	37.5	13,132,690	62.5
1950	10,196,781	37.6	11,393,129	42.0	15,741,612	58.0
1951	15,757,568	43.9	17,338,545	48.3	18,569,578	51.7
1952	19,172,025	46.6	20,573,899	50.0	20,602,272	50.0
1953	22,663,146	46.7	24,333,992	50.2	24,153,000	49.8
1954	27,673,195	50.6	29,821,463	54.5	24,893,753	45.5
1955	32,840,504	57.4	35,342,823	61.7	21,898,850	38.3
1956	40,165,958	59.3	43,392,973	64.1	24,318,037	35.9
1957	47,464,945	57.8	51,278,631	62.4	30,861,311	37.6
1958	56,188,809	59.4	60,843,354	64.0	34,257,693	36.0

—(Ray & Ray Compilation)

Local Service Airline Growth, Operations Years 1945 through 1958

Year	Revenue Miles	Revenue Passengers	Revenue Passenger Miles (000)	Passenger Load Factor (%)	Revenue Ton Miles (000)	Ton Mile Util. Factor (%)
1945	310,783	4,152	1,312	52.76	136	42.50
1946	1,287,971	25,118	6,812	37.92	637	41.35
1947	8,354,787	236,997	46,990	30.08	4,666	31.93
1948	16,335,284	427,276	88,937	27.35	9,026	29.01
1949	24,208,377	683,601	136,643	28.51	14,318	30.90
1950	33,552,214	983,205	199,612	33.02	21,344	30.90
1951	37,797,136	1,462,083	291,296	38.20	30,709	35.30
1952	40,697,348	1,703,730	336,919	38.64	35,131	35.69
1953	45,085,915	1,999,867	387,060	39.47	39,645	35.67
1954	48,447,951	2,423,432	461,736	44.59	47,162	40.00
1955	51,802,611	2,963,936	537,017	47.99	54,988	43.26
1956	60,529,316	3,516,242	644,994	48.34	66,474	44.04
1957	68,458,103	4,235,921	766,214	49.87	78,514	45.33
1958	73,555,127	4,583,656	844,372	50.54	86,590	46.09

—(Ray & Ray Compilation)

Local Service Airlines Operating Expenses Years 1945 through 1958

Year	Direct Aircraft Expense: Flying Operations	Direct Aircraft Expense: Maintenance—Flight Equip.	Direct Aircraft Expense: Depreciation—Flight Equip.	Direct Aircraft Expense: Total	Ground and Indirect Expense	Total Expense
1945	$ 56,415	$ 37,137	$ 16,517	$ 110,071	$ 117,222	$ 227,293
1946	268,304	187,430	107,600	563,334	640,040	1,203,374
1947	1,883,686	1,115,027	854,848	3,853,561	4,123,983	7,977,544
1948	4,134,962	2,072,832	1,303,563	7,511,357	6,995,512	14,506,869
1949	6,280,727	3,147,538	1,910,785	11,339,050	10,216,991	21,556,041
1950	8,422,726	3,463,246	1,492,366	13,378,338	13,731,864	27,110,202
1951	10,678,202	4,211,381	1,596,032	16,485,615	18,541,338	35,026,953
1952	13,116,658	5,351,865	2,070,486	20,539,009	21,970,066	42,509,075
1953	15,430,335	6,354,124	2,422,092	24,206,551	25,614,810	49,821,361
1954	17,246,089	5,950,087	1,893,201	25,089,377	28,016,163	53,105,540
1955	18,077,016	6,619,511	1,811,914	26,508,441	30,329,525	56,837,966
1956	21,615,379	8,284,666	2,090,057	31,990,102	36,349,167	68,339,269
1957	26,509,789	10,908,338	2,836,411	40,254,538	42,645,677	82,900,215
1958	29,268,007	11,869,477	3,380,842	44,518,326	48,812,539	93,330,865

—(Ray & Ray Compilation)

Local Service Airline Revenues and Expenses Years 1945 through 1958 Cents Per Revenue Mile

Year	Revenues: Passenger	Revenues: Total Non-Mail	Revenues: Mail Pay	Revenues: Total	Total Expense	Break Even Need
1945	20.82	21.20	25.06	46.26	73.14	51.94
1946	24.43	27.09	56.54	83.63	93.43	66.34
1947	27.29	29.55	69.37	98.92	95.48	65.93
1948	28.57	30.58	56.37	86.95	88.81	58.23
1949	30.38	32.53	54.25	86.78	89.04	56.51
1950	30.39	33.95	46.92	80.87	80.80	46.85
1951	41.69	45.87	49.13	95.00	92.67	46.80
1952	47.11	50.56	50.62	101.18	140.45	53.89
1953	50.27	53.97	53.57	107.54	110.50	56.53
1954	57.12	61.56	51.38	112.94	109.61	48.05
1955	63.40	68.23	42.27	110.50	109.72	41.49
1956	66.36	71.69	40.18	111.87	112.90	41.21
1957	69.33	74.91	45.08	119.99	121.10	46.19
1958	76.80	82.72	46.57	129.29	126.89	44.17

—(Ray & Ray Compilation)

the first time in history can look forward realistically to the time when subsidy will be required only for service into towns and over routes that can not generate enough traffic to pay for the service.

It was also in our 1956 edition that we announced the news that the Fairchild F-27 would be produced for several of the carriers. Today, three years later, four of the locals are operating the F-27 with more to follow. Passenger acceptance of this turbine-powered airliner has surpassed the most optimistic predictions, and while it might be a little early to completely analyze it operationally and economically, there's little doubt but that the F-27 is a fine local service airplane, capable of being adapted to a large portion of the local route structures, with long years of profitable utilization ahead for it.

The trunks are releasing numerous Convairs and Martins at reasonable prices and the locals are adding them to their fleets. These airplanes of proven design are likewise adaptable to certain local carrier routes and the Convair 340's and 440's can be converted to turbine power with Allison and Napier Eland propjet engines already approved.

It is quite clear that the F-27, the Convairs and the Martins are not going to answer the total equipment problem of any carrier on all of its routes. There are many segments where only 8 or 10 passengers will be the loads and this kind of volume will not justify anything larger than the old DC-3 workhorse. There are many local service proponents who believe this is true *local* service — not the high-density terminal-to-terminal business at peak travel hours. They maintain that the need for a smaller aircraft than the F-27 is greater today than ever before. Until it comes, however, the DC-3 will have to keep going. Its retirement simply isn't in sight, especially with the "Maximizer" conversion that speeds it up and makes it an all-round better airplane.

Uncle Won't Pay

While equipment was stealing the spotlight on the local service scene in mid-1959, largely as a result of the guaranteed loan legislation, it was still a case of "the Lord giveth and the Lord taketh away" for the local service carriers. At this writing, the Civil Aeronautics Board has no money with which to pay the local carriers what the government owes them. A supplemental appropriation of $18,000,000 was requested by CAB of the present Congress. This need was created when Congress last year cut down CAB's budget request. The House recently

cut the appropriation to $12,000,000. The Senate might raise it to $16,000,000 before it goes to conference. While no one expects to be hurt in the process, and the local service carriers probably will get what's coming to them, the situation does point up the peculiar way the government does business and contributes to the financial instability of the carriers. Such tactics add to the pressure of the locals to drop the smaller cities and other low traffic generating points.

Both the Congress and CAB in recent actions have authorized extensive route additions and have encouraged the change over to larger airplanes. New routes and new airplanes mean larger subsidies for a while. But these two factors are the first steps toward reduction and eventual elimination of subsidy. Individual Congressmen raise holy cain when a town in their district is dropped by the Board for lack of traffic. Yet they hit the ceiling when the bill for this service is presented through requests for appropriations. No one knows the answer to this strange enigma and we suspect the locals will have to develop a strong and effective lobby, or bring pressure to bear from the political powers of all the communities they serve to achieve a more realistic and efficient method of building strong local air service and putting it on the road to eventual self-sufficiency such as most trunk air lines have achieved.

Use It or Lose It

But by the same token, the civic and political figures of the towns now enjoying local service, particularly those who can not board the required 150 passengers per month to qualify under the CAB's "use it or lose it" formula, had better go to work and help sell the service to their respective communities.

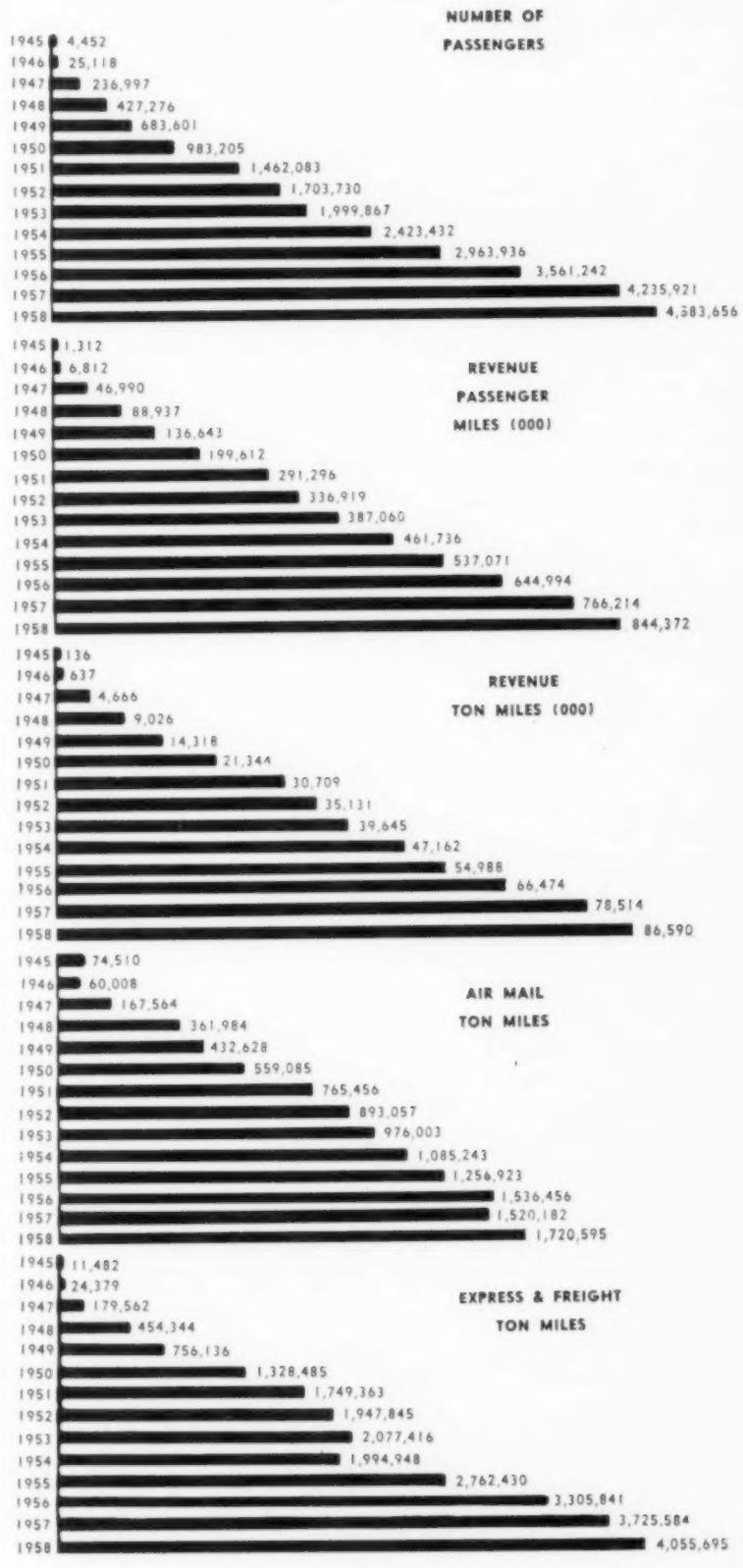
Too often in the past year a city or town has awakened to find itself removed from the airline system map and all the telegrams to Congressmen, editorials in the papers and complaints they can muster will not bring back the service they failed to utilize when they had it.

While we do not agree with the CAB policy of 150 passengers per month or else, there is plenty of evidence to prove many towns could generate more traffic if they went to work on it in partnership with local carrier traffic people. A more realistic formula would let the 150 passengers per month apply to a basic two daily round trips, while a lesser figure, perhaps 100 a month or even less, would be the requirement for communities receiving only a single daily round trip. Our point is this: Minimum passenger traffic requirements should be related to the amount of service offered and the effectivness of its scheduling in generating traffic.

Trouble is created when local service is authorized into a small community on an unrealistic use-it-or-lose-it basis only to face up to the inevitable withdrawing of that serv-

(Continued on page 74)

Trends of Progress in Local Air Service
1945-1958



Fairchild F-27's operated by Piedmont, Pacific, Bonanza and West Coast local service airlines are pictured at left, with a load of passengers boarding a Bonanza F-27 above.

F-27 Early Success In Local Service

FOUR local service airlines — West Coast, Piedmont, Bonanza and Pacific — were operating 20 new propjet Fairchild F-27's in daily service as of May 15, 1959, and the new airplane's impact on local service improvements was growing in significance. Impressive gains in passenger loads were scored from the start of F-27 operations last September with West Coast, in November with Piedmont, in March, 1959, with Bonanza and in April with Pacific.

It is too early for new F-27 operating records to be complete or all-conclusive, but the introductory operations have convinced observers that the F-27 has established itself as an immediate success in feeder and short-haul local air service. It was designed to be just that and is the first transport specifically engineered to meet the needs of local service carriers.

There have been some "bugs" which scheduled daily service usually brings out in any newly-developed transport, but no major faults have revealed themselves yet and "fixes" have ironed out minor problems as they became known. A major blessing for the new F-27 was its Rolls-Royce propjet

Designed for local service operations, the F-27 has a large baggage compartment forward with easy loading. Some F-27's were ordered with large cargo doors instead of baggage door shown above.

power plant, proved on Viscounts.

Early records show the F-27 is attracting more passengers in every case.

Take Bonanza Air Lines, for example, which inaugurated F-27A Silver Dart jetprop service on March 29, 1959, over three segments — one daily Las Vegas-Reno round trip, three daily Las Vegas-Phoenix round trips, and one daily Phoenix-Salt Lake City round trip. The following record for the first month of F-27 operations over those segments during April, 1959, compares average passenger loads with DC-3's for April, 1958:

	DC-3	F-27A
Las Vegas-Reno	14.2	24.5
Las Vegas-Phoenix	10.8	22.5
Phoenix-Salt Lake City	13.1	23.1
Average	12.2	23.1

Thus the new Fairchild attracted and carried average passenger loads almost double those carried by DC-3's during the same month a year ago. On the three segments on which the Silver Darts were operated in April, the total segment revenue passenger miles (including DC-3's) were up 51.60% over April, 1958, and where the Silver Dart flights replaced DC-3's, Bonanza had an 89.74% increase in revenue passenger miles for 1959 over 1958.

Piedmont Airlines, which has operated Fairchild F-27's since mid-November, 1958, reports excellent public acceptance for its 8 new Fairchilds. During the first months of F-27 operation — in the winter when traffic is traditionally low — Piedmont carried 45% more passengers per plane mile than in comparable earlier periods when DC-3 equipment was used exclusively on the same schedules. The number of passengers carried by Piedmont during the first quarter of 1959 increased 22% over the same 1958 period and in March and April, 1959, Piedmont set new traffic records with gains of 36% and 22% respectively over the same 1958 months. C. Gordon Brown, Jr., Piedmont vice president, attributed the increased traffic to the successful introduction and widespread acceptance of the F-27 and to generally improved business conditions in much of this area.

In costs, Piedmont reports its F-27's were flown at a cost of 101.79 cents per mile during the first stages of operation, this comparing favorably with 120.24 cents per mile cost of Martin equipment operated by other local carriers during introductory periods and 107.84 cents per mile cost local service airlines reported for Convairs in early months of their operation. Piedmont's F-27's had a schedule completion record of 94% for their first three months in operation.

Operating facts of a more solid state have been gathered by West Coast Airlines, which was the first local service carrier to order the F-27 originally and first to operate it, beginning in September, 1958. Latest figures cover April, 1959, and show a 59.20% increase in total number of passengers per mile for flights on which F-27's replaced DC-3's. Here is West Coast's comparison of selected flights during April, 1959, for F-27's in replacement of DC-3's for April, 1958:

Flight	Total Passengers Per Mile Apr. '58	Apr. '59	% Inc.
Seattle-Klamath Falls	94.8	124.6	41.98
Portland-Klamath Falls	52.7	91.9	74.38
Klamath Falls-Seattle	77.1	133.7	73.41
Klamath Falls-Portland	66.4	106.0	59.64
Seattle-Walla Walla	39.2	52.3	33.42
Seattle-Spokane	27.1	49.4	82.29
Seattle-Lewiston	60.5	88.4	46.12
Portland-Spokane	38.6	48.3	25.13
Seattle-Idaho Falls	111.6	173.6	55.55
Lewiston-Seattle	48.6	81.2	67.08
Walla Walla-Seattle	55.2	79.0	43.12
Idaho Falls-Seattle	99.8	194.8	95.19
Yakima-Portland	17.6	23.2	31.82
	789.2	1,256.4	59.20

Here are West Coast's latest utilization figures for its 6 F-27's:

For 6 months ended April 30, 1959 — 1,041 plane days, 5,002:30 revenue hours flown, 28:41 non-revenue hours flown, 5,286:11 total flying hours, 4:48 hours average daily revenue utilization.

For first 4 months of 1959 — 720 plane days, 3,551:15 revenue hours

(Continued on page 74)

Fairchild F-27
Box Score

Carriers operating F-27's as of May 15

Airline	First F-27 Svc.	No. F-27's In Svc.
West Coast Airlines	Sept., '58	6
Avensa	Oct., '58	5
Quebecair	Oct., '58	2
Piedmont Airlines	Nov., '58	8*
N. Consolidated	Dec., '58	3
Bonanza Air Lines	Mar., '59	3
Pacific Air Lines	Apr., '59	3
Total F-27's in Service		30

*One in Jan., 2 in Dec., 2 in Jan., 2 in Feb., 1 in Mar.

F-27's on order, delivered and in service as of May 1, 1959—

	Firm Orders	Del'd.	In Svc.
Aerovias Ecuatorianas	1	—	—
Avensa	5	5	5
Aloha Airlines	3	1	—
Bonanza Air Lines	6	3	3
N. Consolidated Airlines	3	3	2
Ozark Air Lines	3	—	—
Pacific Air Lines	6	3	3
Piedmont Airlines	8	8	8
Quebecair	2	2	2
Trans Mar de Cortes	1	—	—
West Coast Airlines	6	6	6
Wien Alaska Airlines	2	—	—
Corporations (see below)	20	12	12
Totals	66	43	41

Corporate purchasers include Continental Can, General Tire, Butler Aviation, Bank of Mexico, Westinghouse, Ideal Cement, Champion Spark Plug, Kimberly-Clark, R. J. Reynolds, Noland Co. and Reynolds Metals.

Passengers board a West Coast Airlines F-27 at Seattle in the scene above. Integral stair-door is at rear of cabin. Fairchilds are generating more traffic than DC-3's attracted.

Twenty Leading Cities Served By Eac

In Passengers Boar

ALLEGHENY		BONANZA		CENTRAL		FRONTIER		LAKE CENTRAL		MOHAWK		NORTH CENTRAL	
1. New York	79,420	Phoenix	43,215	Dallas	17,975	Denver	44,040	Chicago	29,075	New York	126,926	Chicago	232
2. Pittsburgh	68,275	Las Vegas	34,459	Fort Smith	14,103	Phoenix	19,015	Indianapolis	20,253	*Utica	50,389	Milwaukee	97
3. Harrisburg	40,113	Los Angeles	26,937	Kansas City	13,395	Albuquerque	18,304	Columbus	18,010	Binghamton	48,659	Minneapolis	53
4. Scranton	36,552	*El Centro	10,909	Oklahoma City	7,601	Grand Junction	16,571	Cleveland	9,485	Syracuse	41,046	Detroit	47
5. Washington	33,327	*Yuma	10,414	St. Louis	7,304	Salt Lake City	16,364	*Lafayette	9,414	Buffalo	25,962	*Duluth	31
6. Erie	26,950	Reno	8,586	Tulsa	6,602	*Farmington	15,951	South Bend	8,684	*Ithaca	25,842	Madison	29
7. *Bradford	22,894	San Diego	8,409	*Fayetteville	6,520	Billings	9,553	Youngstown	8,034	Boston	21,504	*Green Bay	28
8. Williamsport	19,732	Salt Lake City	7,504	Joplin	6,079	*Flagstaff	8,824	*Mansfield	7,571	Elmira	21,166	*Kalamazoo	23
9. Cleveland	16,445	Palm Springs	6,529	Lawton	6,045	Casper	8,227	Cincinnati	7,560	Rochester	20,249	*Oshkosh	23
10. Philadelphia	13,246	Ontario	6,261	Little Rock	5,316	*Durango	6,298	Terre Haute	6,860	Detroit	12,864	South Bend	20
11. Parkersburg	11,626	*Riverside	4,124	Wichita	4,743	Pueblo	6,200	Grand Rapids	6,311	Albany	12,770	*Battle Creek	17
12. Detroit	11,321	*Santa Ana	3,836	Topeka	4,425	*Riverton	4,643	*Lima	6,067	Watertown	7,679	*Wausau	12
13. Atlantic City	11,272	*Prescott	2,173	Fort Worth	3,981	*Cortez	4,510	Pittsburgh	5,929	Erie	7,653	*Beloit	9
14. *Jamestown	10,730	*Apple Valley	2,129	Hot Springs	3,816	Cheyenne	4,159	Dayton	4,578	Poughkeepsie	6,207	Grand Rapids	8
15. *Phillipsburg	9,060	*Blythe	1,510	*Ponca City	2,852	Tucson	4,075	*Danville	4,029	*White Plains	5,494	Lansing	6
16. Huntington	8,717	*Cedar City	1,325	*Liberal	2,798	*Gallup	3,207	*Kalamazoo	3,507	Worcester	3,979	*La Crosse	6
17. *Johnstown	8,228	*Kingman	1,238	*Enid	2,734	*Montrose	2,856	Buffalo	3,309	*Ogdensburg	2,994	*Eau Claire	6
18. *Altoona	6,388	*Provo	404	Denver	2,300	*Vernal	2,562	*Kokomo	3,208	Springfield	2,300	*Stevens Point	6
19. Buffalo	5,894	*Tonopah	380	Amarillo	2,068	*Alamosa	2,531	Detroit	2,879	*Glen Falls	2,266	*Jackson	6
20. Lancaster	5,517	*Hawthorne	279	Bartlesville	1,998	*Laramie	2,511	*Bloomington	2,760	Keene	625	Omaha	6

*Indicates city served exclusively by local service airlines.

1958 Traffic Record of Cities Served by Local Service Airlines

(Ranked in Order by Number of Boarding Passengers; Compiled by FLIGHT MAGAZINE from CAB Records)

NOTE: AL, Allegheny; BL, Bonanza; CN, Central; FL, Frontier; LC, Lake Central; MO, Mohawk; NO, North Central; OZ, Ozark; PC, Pacific; PI, Piedmont; SO, Southern; TT, Trans-Texas; WC, West Coast. Where more than one local airline is indicated as serving a city, the first carrier listed boarded the greatest number of passengers, the second listed boarded the second greatest number, etc. * Indicates a city served exclusively by one or more local service airlines. (1) Local service operations were inaugurated during 1958. (2) Termination of Service during 1958. (3) Seasonal service. (4) City named is one of two or more cities designated for service through a joint airport.

Rank 1958	Rank 1957	City and State	Carrier	Passengers Boarded		Percent Change	Passengers Boarded Per Departure
1	1	Chicago, Ill.	NO, OZ, LC	369,762	331,724	11.4	15.4
2	2	New York, N. Y.	MO, AL	206,346	184,331	11.9	19.7
3	3	Milwaukee, Wisc.	NO, OZ	100,981	96,345	4.8	6.8
		Los Angeles-Burbank, Calif.	PC, BL	100,612	87,503	15.0	11.0
4	4	Los Angeles, Calif.	PC, BL	84,559	77,904	8.5	13.0
		San Francisco-Oakland, Calif.	PC	83,474	79,816	4.6	8.3
5	8	Washington, D. C.	PI, AL	80,604	62,590	28.8	14.9
6	5	San Francisco, Calif.	PC	78,891	74,000	6.6	11.3
		Dallas-Fort Worth, Texas	TT, CN	76,063	70,065	8.6	4.3
7	7	Detroit, Mich.	NO, MO, AL, LC	74,501	65,013	14.6	7.3
8	6	Pittsburgh, Pa.	AL, LC	74,204	73,401	1.1	12.7
9	9	Minneapolis, Minn. (4)	NO, OZ	63,888	60,069	6.4	9.6
10	10	Dallas, Texas	TT, CN	62,496	58,556	6.7	6.0
11	11	Phoenix, Ariz.	BL, FL	62,230	54,918	13.3	9.8
12	12	St. Louis, Mo.	OZ, CN	60,502	53,230	13.7	10.6
13	13	Atlanta, Ga.	SO	55,257	50,915	8.5	13.7
14	15	*Utica, N. Y.	MO	50,389	45,865	9.9	7.0
15	16	Cincinnati, Ohio	PI, LC	48,699	44,740	8.8	11.5
16	14	Binghamton, N. Y. (4)	MO	46,659	48,263	— 3.4	8.0
17	25	Las Vegas, Nev. (4)	BL, PC	46,632	33,480	39.3	10.7
18	17	Denver, Colo.	FL, CN	46,340	41,118	12.7	13.0
19	40	Syracuse, N. Y.	MO	41,046	26,068	57.5	8.9
20	23	Harrisburg, Pa.	AL	40,113	33,870	18.4	5.9
21	18	Seattle, Wash.	WC	39,099	39,400	— .9	11.2
22	20	Erie, Pa.	AL, MO, LC	36,605	35,239	3.9	4.2
23	27	Scranton, Pa.	AL	36,552	29,655	23.3	6.8
24	22	Portland, Ore. (4)	WC	35,458	34,549	2.6	9.4
25	24	Buffalo, N. Y. (4)	MO, AL, LC	35,165	33,653	4.5	7.5
26	19	Peoria, Ill.	OZ	35,064	36,186	— 3.2	6.1
27	21	Bristol, Tenn. (4)	PI	33,003	35,232	— 6.8	4.1
28	26	Roanoke, Va.	PI	32,926	32,233	2.1	3.6
29	28	Memphis, Tenn.	SO, TT	31,748	29,384	8.0	9.6
30	38	*Duluth, Minn. (4)	NO	31,375	26,584	18.0	6.3
31	30	Louisville, Ky.	PI, OZ	31,264	28,990	7.8	11.6
32	35	Madison, Wisc.	NO	29,258	27,812	5.2	5.8
33	36	South Bend, Ind.	NO, LC	29,011	27,424	5.8	4.3
34	34	Columbus, Ohio	LC, PI	28,936	28,101	3.0	7.3
35	41	*Green Bay, Wisc.	NO	28,745	24,540	17.1	3.2
36	31	Monterey, Calif. (4)	PC	28,274	28,980	— 2.5	9.0
37	45	*San Jose, Calif. (4)	PC	28,112	22,568	24.6	6.7
38	47	*Kalamazoo, Mich.	NO, LC	27,309	22,036	23.9	4.1
39	32	Houston, Texas	TT	26,230	28,874	—10.1	8.4
40	37	*Eureka, Calif. (4)	PC	25,974	27,403	— 5.5	8.7
41	49	Cleveland, Ohio	AL, LC	25,930	21,282	21.8	11.6
42	33	*Ithaca, N. Y.	MO	25,842	28,370	— 9.8	8.3
43	46	Indianapolis, Ind.	LC, OZ	25,410	22,184	14.5	6.5
44	29	*Rockford, Ill.	OZ	25,190	29,161	—15.8	7.1
45	56	Salt Lake City, Utah	FL, BL	23,868	17,851	33.7	9.4
46	61	*Oshkosh, Wisc.	NO	23,723	16,562	43.2	4.6
47	39	*Bradford, Pa.	AL	22,894	26,252	—14.7	3.4
48	43	Springfield, Ill.	OZ	22,749	23,690	— 4.1	3.5
49	48	Charlotte, N. C.	PI, SO	22,592	21,411	5.5	7.3
50	51	Huntington, W. Va.	PI, AL	21,657	20,785	4.2	4.6
51	44	Boston, Mass.	MO	21,504	23,216	— 8.0	11.4
52	42	Elmira, N. Y.	MO	21,166	24,502	—15.8	5.5
53	50	Richmond, Va.	PI	20,940	21,003	— .3	4.8
54	69	Rochester, N. Y.	MO	20,249	14,614	38.6	5.6
55	52	Williamsport, Pa.	AL	19,732	20,365	— 3.2	4.4
56	78	Kansas City, Mo.	CN, OZ	19,655	13,206	48.8	8.7
57	55	Sacramento, Calif.	PC	18,698	17,974	4.0	5.4
58	59	Boise, Idaho	WC	18,672	16,952	10.1	9.0
59	63	Albuquerque, N. Mex.	FL	18,304	16,185	13.1	10.4
60	53	Parkersburg, W. Va.	AL, PI	18,097	19,121	— 5.7	3.6
61	58	Yakima, Wash.	WC	17,296	17,194	.6	3.3
62	71	*Battle Creek, Mich.	NO	17,275	14,479	19.3	3.7
63	60	Beaumont, Texas (4)	TT	17,039	16,683	2.1	6.7

Traffic Growth At 392 Stops

By E. H. PICKERING

THE smallest growth in number of passengers carried in the 14-year history of the local service airlines took place in 1958. In numbers of passengers, the growth was a mere 7¾% over 1957 as compared with a growth of 19% in 1957 over 1956 and a 21% growth in the previous year.

However, this increase was made in the face of an over-all *decrease* in trunk line traffic, and despite the fact that very little effective expansion took place in the route systems of the locals.

Although 15 new points appear in the listing of local airline stops this year, and only three were eliminated, for a net gain of 12 stops, service to nine of the 15 was not begun until quite late in the year. The 15 new points boarded only 16,844 passengers during 1958, amounting to less than ½ of 1% of the total.

The current year, 1959, will show a much stronger growth as the general industry trend is higher and the effect of substantial new route awards will first be felt in 1959.

LOCAL SERVICE AIRLINES
Comparison of Average Passenger Loads
1957 - 1958

Carrier	1957	1958	Increase
Allegheny	12.0	13.3	1.3
Bonanza	10.4	10.5	0.1
Central	7.0	7.2	0.2
Frontier	10.6	10.1	(0.5)
Lake Central	9.2	9.6	0.4
Mohawk	15.3	17.3	2.0
North Central	11.2	11.1	(0.1)
Ozark	10.3	11.4	1.1
Pacific	16.0	15.5	(0.5)
Piedmont	11.3	11.1	(0.2)
Southern	9.8	10.3	0.5
Trans-Texas	8.8	9.0	0.2
West Coast	11.2	11.4	0.2
Average	11.2	11.5	0.3

By Each Local Service Airline

gers Boarded

OZARK		PACIFIC		PIEDMONT		SOUTHERN		TRANS-TEXAS		WEST COAST		Avg. All Carriers	
[illegible]	107,858	San Francisco	78,891	Washington	45,277	Atlanta	55,257	Dallas	44,521	Seattle	39,099	1.	72,645
t. Louis	53,198	Los Angeles	57,622	Cincinnati	41,139	Memphis	23,479	Houston	26,230	Portland	35,458	2.	41,660
[illegible]	35,064	Monterey	28,274	Bristol	33,003	Monroe	12,516	Beaumont	17,039	Boise	18,672	3.	27,780
ockford	25,190	*San Jose	28,112	Roanoke	32,926	New Orleans	12,020	San Antonio	15,578	Yakima	17,296	4.	23,133
pringfield, Ill.	22,740	*Eureka	25,974	Richmond	20,940	Columbus, Ga.	8,789	Shreveport	9,846	*Pasco	13,271	5.	18,286
hampaign	16,213	Sacramento	18,698	Louisville	20,101	*Eglin AFB	7,745	Fort Worth	9,586	Spokane	11,029	6.	15,788
ecatur	14,242	Bakersfield	16,058	Charlotte	20,061	*Greenville, Miss.	7,498	*Tyler	8,821	*North Bend	11,016	7.	14,104
oline	14,010	Burbank	16,053	*Charlottesville	16,930	*Columbus, Miss.	6,915	*McAllen	8,678	Walla Walla	10,535	8.	12,908
ainsville	11,163	Santa Barbara	12,471	Charleston	15,734	Jacksonville	6,574	Corpus Christi	8,448	*Lewiston	10,287	9.	11,804
inneapolis	10,729	Las Vegas	12,173	*Lynchburg	15,310	Baton Rouge	6,475	Memphis	8,269	*Port Angeles	7,024	10.	10,089
aducah	10,501	*Redding	8,755	Norfolk	13,992	Jackson	6,355	*Harlingen	8,176	Medford	6,691	11.	9,040
pringfield, Mo.	7,548	*Santa Maria	8,388	Huntington	12,940	Panama City	6,092	*Longview	7,715	*Pullman	6,313	12.	7,637
olumbia	7,108	Medford	6,635	Raleigh	12,509	Gulfport	5,878	Austin	7,468	Pocatello	5,810	13.	6,922
edar Rapids	6,489	*Chico	5,752	Lexington	11,019	Birmingham	5,265	San Angelo	6,635	Idaho Falls	5,700	14.	6,231
ansas City	6,260	*Oxnard	5,020	Columbus	10,926	Albany	5,015	Little Rock	5,337	*Wenatchee	5,484	15.	5,524
oplin	5,352	Oakland	4,583	Fayetteville	10,878	*Tuscaloosa	4,999	Lake Charles	4,394	*Hoquiam	5,176	16.	5,048
ndianapolis	5,157	*Crescent City	4,458	Wilmington	8,496	*Gadsden	4,604	Texarkana	4,382	*Lewiston	10,287	17.	4,588
uincy	5,080	*Paso Robles	4,279	Asheville	8,355	Valdosta	4,604	*Laredo	4,330	Twin Falls	4,733	18.	4,198
efferson City	4,413	*Santa Rosa	2,705	Winston-Salem	8,236	*Natchez	3,924	*Victoria	4,217	Eugene	4,451	19.	3,856
arlington	4,288	*Marysville	2,372	Greensboro	7,557	Dothan	3,831	Hot Springs	3,797	*Astoria	4,379	20.	3,486
										*Ephrata	3,711		

In total numbers of passengers, 1958 showed a better than 300,000 increase over 1957, but was less than half the 720,000 increase shown the previous year. Only two of the 13 locals showed a negative growth in 1958. On the other hand, five of the locals showed growth well above the industry average with Bonanza leading with over a 22% growth.

In 1957 the first nine cities accounted for 25% of the total local airline boardings, in 1958 the first eight cities accomplished the same feat. The first 33 cities topping the 1958 list accounted for half of the local service boardings; in 1957 it took 35 cities to do the same job.

In 1958 for the first time, 100 cities exceeded 10,000 passenger boardings — up two cities from the 1957 list.

Chicago, the city that in 1957 became the first to board over 300,000 passengers, bids well to become the first to board over 400,000 during

LOCAL SERVICE AIRLINES
Number of Aircraft Operated
4th Quarters, 1957 and 1958

Carrier	1957	1958	Increase
Allegheny	22	23	1
Bonanza	10	10	0
Central	13	14	1
Frontier	16	17	1
Lake Central	10	10	0
Mohawk	22	21	(1)
North Central	27	31	4
Ozark	20	24	4
Pacific	18	19	1
Piedmont	21	23	2
Southern	13	16	3
Trans-Texas	20	20	0
West Coast	14	19	5
Totals	226	247	21

LOCAL SERVICE AIRLINES
Comparison of Total Revenue Ton-Miles Flown
1957 - 1958

Carrier	1957	1958	% Increase
Allegheny	7,826,483	8,638,754	10.4
Bonanza	3,312,115	4,238,219	28.0
Central	2,436,625	2,780,325	14.1
Frontier	6,747,030	7,036,527	4.3
Lake Central	2,641,417	3,024,510	14.5
Mohawk	8,253,058	8,771,278	6.3
North Central	10,843,896	12,792,316	18.0
Ozark	6,584,376	7,464,695	13.4
Pacific	7,206,535	8,245,835	14.4
Piedmont	8,474,141	8,754,574	3.3
Southern	3,919,780	4,333,498	10.6
Trans-Texas	5,823,430	5,875,284	0.9
West Coast	4,445,150	4,634,051	4.2
Totals	78,514,036	86,589,866	10.3

Rank 1958	Rank 1957	City and State	Carrier	Passengers Boarded 1958	Passengers Boarded 1957	Percent Change 1958/57	Passengers Per Departure
64	68	*Charlottesville, Va.	PI	16,930	14,614	15.8	2.8
65	54	Grand Junction, Colo.	FL	16,571	18,154	— 9.5	5.1
66	72	*Champaign, Ill. (4)	OZ	16,213	13,800	17.5	5.4
67	77	Bakersfield, Calif.	PC	16,058	13,252	21.2	4.8
68	100	Burbank, Calif.	PC	16,053	9,599	67.2	6.1
69	65	*Farmington, N. Mex.	FL	15,921	15,607	2.0	3.3
70	62	Charleston, W. Va.	PI	15,734	16,237	— 3.2	3.2
71	57	San Antonio, Texas	TT	15,578	17,531	—12.5	3.8
72	81	*Lynchburg, Va.	PI	15,310	12,641	21.1	2.3
73	84	Grand Rapids, Mich.	NO, LC	14,876	12,006	23.9	4.3
74	80	*Decatur, Ill.	OZ	14,242	12,702	12.1	3.8
75	73	Fort Smith, Ark.	CN	14,103	13,618	3.6	3.6
76	70	Moline, Ill. (4)	OZ	14,010	14,518	— 3.6	4.9
77	64	Norfolk, Va.	PI	13,992	15,773	—12.7	6.5
78	86	Fort Worth, Texas	TT, CN	13,567	11,509	17.9	1.8
79	66	Medford, Ore.	WC, PC	13,236	15,486	—16.2	4.9
80	75	*Pasco, Wash.	WC	13,271	13,337	— .5	3.8
81	74	Philadelphia, Pa. (4)	AL	13,246	13,510	— 2.0	5.8
82	82	Albany, N. Y. (4)	MO	12,770	12,249	4.2	4.5
83	85	Monroe, La.	SO	12,516	11,619	7.7	7.6
84	92	Raleigh, N. C. (4)	PI	12,509	10,928	14.5	4.7
85	83	Santa Barbara, Calif.	PC	12,471	12,217	2.1	5.7
86	89	*Wausau, Wisc.	NO	12,318	11,400	8.0	2.6
87	88	New Orleans, La.	SO	12,020	11,424	5.2	8.9
88	102	Joplin, Mo.	CN, OZ	11,431	9,446	21.0	3.9
89	67	Atlantic City, N. J.	AL	11,272	14,689	—30.0	5.9
90	90	Spokane, Wash.	WC	11,029	11,257	— 2.1	5.0
91	93	Lexington, Ky.	PI	11,019	10,659	3.4	2.4
92	79	*North Bend, Ore. (4)	WC	11,016	12,828	—16.4	5.6
93	87	*El Centro, Calif.	BL	10,909	11,478	— 5.2	5.2
94	76	Fayetteville, N. C.	PI	10,878	13,309	—22.3	3.7
95	145	*Jamestown, N. Y.	AL	10,730	6,079	76.5	2.7
96	91	Little Rock, Ark.	TT, CN	10,653	11,055	— 3.8	4.3
97	96	Walla Walla, Wash.	WC	10,535	10,219	3.1	3.4
98	99	Paducah, Ky.	OZ	10,501	9,660	8.7	6.1
99	98	*Yuma, Ariz.	BL	10,414	10,057	3.5	4.8
100	95	*Lewiston, Idaho (4)	WC	10,287	10,548	— 2.5	3.4
101	101	Shreveport, La.	TT	9,846	9,465	4.0	3.9
102	130	Billings, Mont.	FL	9,553	6,891	38.6	8.1
103	110	*Lafayette, Ind.	LC	9,414	8,322	13.1	4.2
104	121	*Beloit, Wisc. (4)	NO	9,065	7,797	16.3	3.0
105	115	*Phillipsburg, Pa. (4)	AL	9,060	8,120	11.6	3.9
106	112	*Flagstaff, Ariz.	FL	8,824	8,204	7.6	4.2
107	106	*Tyler, Texas	TT	8,821	8,731	1.0	2.2
108	94	Columbus, Ga.	SO	8,789	10,639	—21.0	2.7
109	118	*Redding, Calif.	PC	8,755	8,072	8.5	3.7
110	104	*McAllen, Texas (4)	TT	8,678	9,269	— 6.8	4.7
111	107	Reno, Nev.	BL	8,586	8,623	— .4	11.9
112	103	Wilmington, N. C.	PI	8,496	9,372	—10.3	5.0
113	113	Corpus Christi, Texas	TT	8,448	8,186	3.2	2.7
114	124	San Diego, Calif.	BL	8,409	7,459	12.7	4.0
115	185	*Santa Maria, Calif.	PC	8,388	4,540	84.8	5.6
116	119	Asheville, N. C. (4)	PI	8,355	8,002	4.4	4.4
117	114	Winston-Salem, N. C.	PI	8,236	8,157	1.0	3.1
118	105	*Johnstown, Pa.	AL	8,228	9,140	—11.1	3.2
119	190	Casper, Wyo.	FL	8,227	4,404	86.8	4.2
120	116	*Harlingen, Texas (4)	TT	8,175	8,114	.8	3.2
121	127	Youngstown, Ohio	LC	8,034	7,222	11.2	5.8
122	273	*Eglin AFB, Fla.	SO	7,745	1,916	304.2	11.0
123	125	*Longview, Texas (4)	TT	7,715	7,418	4.0	1.9
124	97	Watertown, N. Y.	MO	7,679	10,114	—31.7	4.6
125	109	Hot Springs, Ark.	CN, TT	7,613	8,397	—10.3	2.8
126	120	Oklahoma City, Okla.	CN	7,601	7,801	— 2.6	3.9
127	111	*Mansfield, Ohio	LC	7,571	8,206	— 8.4	2.9
128	128	Greensboro, N. C. (4)	PI	7,557	7,191	5.1	2.5
129	150	Springfield, Mo.	OZ	7,548	5,869	28.6	3.8
130	108	*Greenville, Miss.	SO	7,498	8,465	—12.9	3.0
131	132	Austin, Texas	TT	7,468	6,821	9.5	2.4
132	117	*Bluefield, W. Va. (4)	PI	7,340	8,104	—10.4	2.5
133	129	Knoxville, Tenn.	PI	7,318	7,155	2.3	7.1
134	134	*Columbia, Mo.	OZ	7,108	6,632	7.2	3.5
135	122	*Port Angeles, Wash.	WC	7,024	7,619	— 8.5	10.0
136	136	*Columbus, Miss.	SO	6,915	6,525	6.0	3.5
137	140	Terre Haute, Ind.	LC	6,860	6,326	8.4	4.8
138	228	Omaha, Neb.	NO, FL	6,810	3,096	120.0	8.7
139	163	Lansing, Mich.	NO	6,752	5,429	24.4	2.7
140	156	*La Crosse, Wisc.	NO	6,707	5,726	17.1	3.7
141	131	San Angelo, Texas	TT	6,635	6,855	— 3.3	5.0
142	139	Tulsa, Okla.	CN	6,602	6,369	3.7	4.0

(Continued on next page)

Passengers Boarded at Fifty Leading Cities Served Exclusively by Local Service Airlines, 1958

Rank 1958	City and State	Revenue Passengers	Airline
1	Utica, N.Y.	50,389	Mohawk
2	Duluth, Minn.	31,375	North Central
3	Green Bay, Wisc.	28,745	North Central
4	San Jose, Calif.	28,112	Pacific
5	Kalamazoo, Mich.	27,309	North Central, Lake Central
6	Eureka, Calif.	25,974	Pacific
7	Ithaca, N. Y.	25,842	Mohawk
8	Rockford, Ill.	25,190	Ozark
9	Oshkosh, Wisc.	23,723	North Central
10	Bradford, Pa.	22,894	Allegheny
11	Battle Creek, Mich.	17,275	North Central
12	Charlottesville, Va.	16,930	Piedmont
13	Champaign, Ill.	16,213	Ozark
14	Farmington, N. Mex.	15,921	Frontier
15	Lynchburg, Va.	15,310	Piedmont
16	Decatur, Ill.	14,242	Ozark
17	Pasco, Wash.	13,271	West Coast
18	Wausau, Wisc.	12,318	North Central
19	North Bend, Ore.	11,016	West Coast
20	El Centro, Calif.	10,909	Bonanza
21	Jamestown, N. Y.	10,730	Allegheny
22	Yuma, Ariz.	10,414	Bonanza
23	Lewiston, Idaho	10,287	West Coast
24	Lafayette, Ind.	9,414	Lake Central
25	Beloit, Wisc.	9,065	North Central
26	Phillipsburg, Pa.	9,060	Allegheny
27	Flagstaff, Ariz.	8,824	Frontier
28	Tyler, Texas	8,821	Trans-Texas
29	Redding, Calif.	8,755	Pacific
30	McAllen, Texas	8,678	Trans-Texas
31	Santa Maria, Calif.	8,388	Pacific
32	Johnstown, Pa.	8,228	Allegheny
33	Harlingen, Texas	8,176	Trans-Texas
34	Eglin AFB, Fla.	7,745	Southern
35	Longview, Texas	7,715	Trans-Texas
36	Mansfield, Ohio	7,571	Lake Central
37	Greenville, Miss.	7,498	Southern
38	Bluefield, W. Va.	7,340	Piedmont
39	Columbia, Mo.	7,108	Ozark
40	Port Angeles, Wash.	7,024	West Coast
41	Columbus, Miss.	6,915	Southern
42	La Crosse, Wisc.	6,707	North Central
43	Fayetteville, Ark.	6,520	Central
44	Eau Clair, Wisc.	6,461	North Central
45	Altoona, Pa.	6,388	Allegheny
46	Stevens Point, Wisc.	6,317	North Central
47	Pullman, Wash.	6,313	West Coast
48	Durango, Colo.	6,298	Frontier
49	Jackson, Mich.	6,233	North Central
50	Lima, Ohio	6,067	Lake Central

—(FLIGHT MAGAZINE Compilation From CAB Data.)

1958 Traffic Record at Local Service Stops

(Continued from preceding page)

Rank 1958	Rank 1957	City and State	Carrier	Passengers Boarded 1958	Passengers Boarded 1957	Percent Change 1958/57	Passengers Boarded Per Departure
143	138	Jacksonville, Fla.	SO	6,574	6,514	.9	6.5
144	....	Palm Springs, Calif.	BL	6,529	....	....	4.8
145	149	*Fayetteville, Ark.	CN	6,520	5,905	10.4	2.5
146	192	Cedar Rapids, Iowa	OZ	6,489	4,245	52.9	3.6
147	144	Baton Rouge, La.	SO	6,475	6,144	5.4	2.5
148	161	*Eau Clair, Wisc.	NO	6,461	5,451	18.5	2.0
149	143	*Altoona, Pa.	AL	6,388	6,225	2.6	3.1
150	126	Jackson, Miss.	SO	6,355	7,283	—14.6	3.8
151	152	*Stevens Point, Wisc. (4)	NO	6,317	5,849	8.0	1.6
152	137	*Pullman, Wash. (4)	WC	6,313	6,523	— 3.3	2.8
153	146	*Durango, Colo.	FL	6,298	6,057	4.0	2.9
154	133	Ontario, Calif. (4)	BL	6,261	6,665	— 6.4	3.6
155	168	*Jackson, Mich.	NO	6,233	5,079	22.7	1.8
156	123	Poughkeepsie, N. Y.	MO	6,207	7,498	—20.8	14.9
157	151	Pueblo, Colo.	FL	6,200	5,865	5.7	2.5
158	154	Wichita, Kans.	CN, OZ	6,139	5,791	6.0	3.3
159	148	Panama City, Fla.	SO	6,092	6,009	1.4	9.0
160	135	*Lima, Ohio	LC	6,027	6,632	— 9.3	3.0
161	167	Lawton, Okla. (4)	CN	6,045	5,103	18.5	4.3
162	155	Gulfport, Miss (4)	SO	5,878	5,733	2.5	4.7
163	157	Pocatello, Idaho	WC	5,810	5,656	2.7	2.9
164	141	*Chico, Calif.	PC	5,752	6,293	— 9.4	2.7
165	162	Idaho Falls, Idaho	WC	5,700	5,436	4.9	5.7
166	176	Lancaster, Pa.	AL	5,517	4,830	14.2	2.9
167	170	*White Plains, N. Y.	MO	5,494	5,043	8.9	5.4
168	142	*Wenatchee, Wash.	WC	5,484	6,253	—14.0	4.3
169	160	*Rhinelander, Wisc.	NO	5,405	5,532	— 2.3	2.9
170	184	*Danville, Ill.	LC, OZ	5,332	4,542	17.4	2.1
171	210	*Hagerstown, Md.	AL	5,297	3,572	48.3	2.9
172	171	Birmingham, Ala.	SO	5,265	4,934	6.7	2.7
173	147	*Hoquiam, Wash. (4)	WC	5,176	6,054	— 7.0	3.8
174	159	Quincy, Ill. (4)	OZ	5,080	5,543	— 9.1	4.2
175	207	*Marquette, Wisc.	NO	5,064	3,712	36.4	2.5
176	175	*Oxnard, Calif.	PC	5,020	4,836	3.8	3.5
177	179	Albany, Ga.	SO	5,015	4,714	6.4	2.5
178	164	*Tuscaloosa, Ala.	SO	4,999	5,367	— 7.4	2.5
179	165	Wheeling, W. Va.	AL	4,982	5,242	— 5.2	2.9
180	186	*Chisholm, Minn. (4)	NO	4,884	4,532	7.8	3.0
181	158	Twin Falls, Idaho	WC	4,733	5,613	—18.6	2.4
182	181	*Riverton, Wyo. (4)	FL	4,643	4,665	— .5	1.9
183	166	*Gadsden, Ala.	SO	4,604	5,219	—13.4	2.3
184	169	Valdosta, Ga.	SO	4,604	5,061	— 9.9	2.3
185	153	Oakland, Calif.	PC	4,583	5,816	—26.9	1.5
186	222	Dayton, Ohio	LC	4,578	3,244	41.1	3.5
187	177	*Cortez, Colo.	FL	4,510	4,809	— 6.6	2.7
188	172	*Crescent City, Calif.	PC	4,458	4,890	— 9.7	2.8
189	174	Eugene, Ore.	WC	4,451	4,839	— 8.7	2.0
190	....	Topeka, Kans. (1)	CN	4,425	....	....	4.0
191	196	*Jefferson City, Mo.	OZ	4,413	4,066	8.5	2.2
192	198	Lake Charles, La.	TT	4,394	4,011	9.5	3.3
193	187	Texarkana, Texas	TT	4,382	4,508	— 2.9	3.2
194	182	*Astoria, Wash.	WC	4,379	4,647	— 6.1	2.6
195	193	*Kinston, N. C.	PI	4,358	4,227	3.1	3.0
196	189	*Escanaba, Mich.	NO	4,356	4,445	— 2.0	4.1
197	173	*Laredo, Texas	TT	4,330	4,846	—11.9	4.0
198	205	*Burlington, Iowa	OZ	4,288	3,822	12.2	3.6
199	199	*Paso Robles, Calif. (4)	PC	4,279	3,988	7.3	3.0
200	208	*Dubuque, Iowa	OZ	4,226	3,675	15.0	3.0
201	178	*Victoria, Texas	TT	4,217	4,777	—13.3	1.6
202	215	Cheyenne, Wyo.	FL	4,159	3,491	19.1	2.2
203	191	*Franklin, Pa. (4)	AL	4,132	4,326	— 4.7	3.4
204	315	*Riverside, Calif.	BL	4,124	1,217	138.9	4.0
205	201	Tucson, Ariz.	FL	4,075	3,939	3.4	3.5
206	202	*International Falls, Minn.	NO	4,032	3,897	3.5	5.5

1959 based upon its increase of 38,000 local boardings in 1958.

Strong growth was shown at Washington (29%), Las Vegas (39%), Syracuse (58%), Oshkosh (43%), Rochester, N. Y. (39%), Kansas City (49%), Burbank (67%), and Jamestown, N. Y. (77%) among the 100 leading cities.

Comparing the ten leading cities served by each airline in 1958 with the top ten for 1957 shows an average growth of only 8%. Bonanza's top ten led with a 17% growth and Central's top ten was second with 15% growth. Two of the locals also showed decreases in their top ten cities.

Milwaukee becomes the third city to join the ultra-exclusive list of cities boarding over 100,000 passengers a year on the locals.

The 15 new stops added to the local system in 1958 are Palm Springs, Calif., Topeka, Kansas, Muncie, Ind., Cedar City, Utah, Sault Ste. Marie, Mich., Huntsville, Ala., Provo, Utah, Lincoln, Neb., Greenwood, Miss., Chadron, Neb., Ainsworth, Neb., Valentine, Neb., Anniston, Ala., and Lusk and Douglas, Wyo.

LOCAL SERVICE AIRLINES
Comparison of Revenue Express and Freight Ton-Miles Flown
1957 - 1958

Carrier	1957	1958	% Increase
Allegheny	374,222	460,393	23.0
Bonanza	102,248	124,538	21.8
Central	112,926	141,839	25.6
Frontier	837,171	773,534	(7.6)
Lake Central	160,526	174,266	8.6
Mohawk	411,549	345,596	(16.0)
North Central	364,478	406,476	11.5
Ozark	349,536	401,782	14.9
Pacific	133,941	149,198	11.4
Piedmont	283,395	298,478	5.3
Southern	132,435	211,877	60.0
Trans-Texas	377,491	432,870	14.7
West Coast	85,666	134,848	57.4
Totals	3,725,584	4,055,695	8.9

Fifty Leading Cities Served By Local Service Airlines

(Ranked in Order by Passengers Boarded Per Departure)

Rank 1958	Rank 1957	City and State	Airline	Psgrs. Per Deptr.
1	1	New York, N. Y.	MO, AL	19.7
2	3	Chicago, Ill.	NO, OZ, LC	15.4
3	2	Poughkeepsie, N. Y.	MO	14.9
4	4	Washington, D. C.	PI, AL	14.9
5	7	Atlanta, Ga.	SO	13.7
6	6	Denver, Colo.	FL, CN	13.0
7	5	Los Angeles, Calif.	PC, BL	13.0
8	13	Pittsburgh, Pa.	AL, LC	12.7
9	9	Reno, Nev.	BL	11.9
10	22	Cleveland, O.	AL, LC	11.6
11	10	Louisville, Ky.	PI, OZ	11.6
12	8	Cincinnati, O.	PI, LC	11.5
13	11	Boston, Mass.	MO	11.4
14	16	San Francisco, Calif.	PC	11.3
15	12	Seattle, Wash.	WC	11.2
16	32	Eglin AFB, Fla.	SO	11.0
17	17	Las Vegas, Nev.	BL, PC	10.7
18	24	St. Louis, Mo.	OZ, CN	10.6
19	14	Albuquerque, N. M.	FL	10.4
20	15	Port Angeles, Wash.	WC	10.0
21	19	Phoenix, Ariz.	BL, FL	9.8
22	28	Memphis, Tenn.	SO, TT	9.6
23	20	Minneapolis, Minn.	NO, OZ	9.6
24	29	Portland, Ore.	WC	9.4
25	21	Salt Lake City, Utah	FL, BL	9.4
26	25	Boise, Idaho	WC	9.0
27	23	Monterey, Calif.	PC	9.0
28	38	Panama City, Fla.	SO	9.0
29	33	New Orleans, La.	SO	8.9
30		Syracuse, N. Y.	MO	8.9
31	26	Eureka, Calif.	PC	8.7
32	23	Kansas City, Mo.	CN, OZ	8.7
33	37	Omaha, Nebr.	NO, FL	8.7
34	31	Houston, Texas	TT	8.4
35	47	Ithaca, N. Y.	MO	8.3
36		Billings, Mont.	FL	8.1
37	35	Binghamton, N. Y.	MO	8.0
38		Huntsville, Ala.	SO	8.0
39	41	Monroe, La.	SO	7.6
40	48	Buffalo, N. Y.	MO, AL, LC	7.5
41	44	Charlotte, N. C.	PI, SO	7.3
42	34	Columbus, O.	LC, PI	7.3
43	43	Detroit, Mich.	NO, MO, AL, LC	7.3
44	39	Knoxville, Tenn.	PI	7.1
45	42	Rockford, Ill.	OZ	7.1
46		Utica, N. Y.	MO	7.0
47	49	Milwaukee, Wisc.	NO, OZ	6.8
48		Scranton, Pa.	AL	6.8
49	45	Beaumont, Texas	TT	6.7
50		San Jose, Calif.	PC	6.7

Fifty Leading Cities Served Exclusively By Local Service Airlines

(Ranked in Order by Passengers Boarded Per Aircraft Departures)

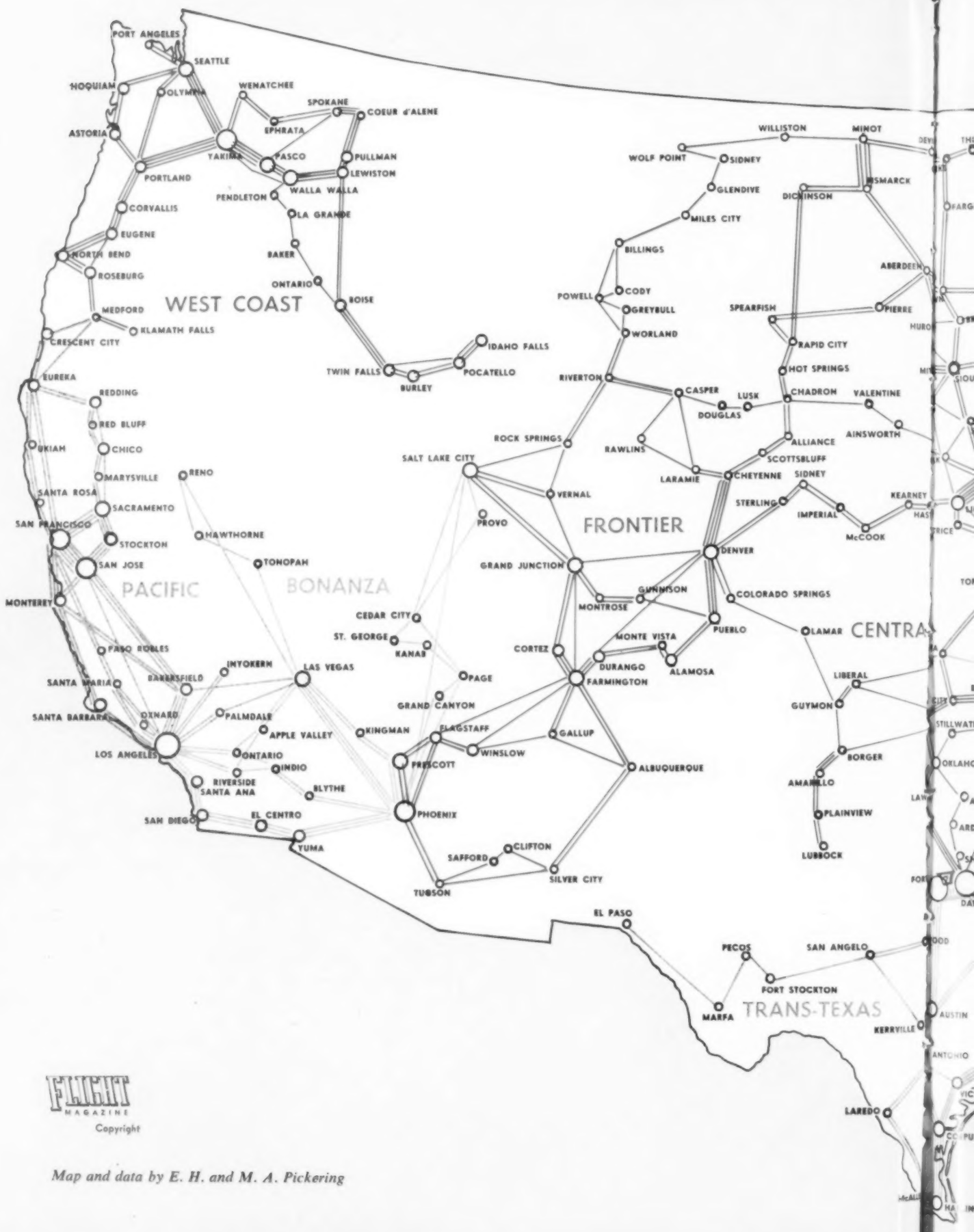
Rank 1958	Rank 1957	City and State	Psgrs. Per Airline Deptr.
1	3	Eglin AFB, Fla.	SO 11.0
2	1	Port Angeles, Wash.	WC 10.0
3	2	Eureka, Calif.	PC 8.7
4	6	Ithaca, N. Y.	MO 8.3
5	5	Rockford, Ill.	OZ 7.1
6	8	Utica, N. Y.	MO 7.0
7	10	San Jose, Calif.	PC 6.7
8	4	Duluth, Minn.	NO 6.3
9	7	North Bend, Ore.	WC 5.6
10	48	Santa Maria, Calif.	PC 5.6
11	12	International Falls, Minn.	NO 5.5
12	23	Champaign, Ill.	OZ 5.4
13	11	White Plains, N. Y.	MO 5.4
14	13	El Centro, Calif.	BL 5.2
15	21	Yuma, Ariz.	BL 4.8
16	14	McAllen, Texas	TT 4.7
17	43	Oshkosh, Wisc.	NO 4.6
18	19	Wenatchee, Wash.	WC 4.3
19	27	Flagstaff, Ariz.	FL 4.2
20	28	Lafayette, Ind.	LC 4.2
21	18	Morehead City, N. C.	PI 4.2
22	9	Ogdensburg, N. Y.	MO 4.2
23	24	Escanaba, Mich.	NO 4.1
24	32	Kalamazoo, Mich.	NO, LC 4.1
25	17	Laredo, Texas	TT 4.0
26		Riverside, Calif.	BL 4.0
27	33	Salisbury, Md.	AL 4.0
28	26	Phillipsburg, Pa.	AL 3.9
29	31	Decatur, Ill.	OZ 3.8
30	25	Hoquiam, Wash.	WC 3.8
31	37	Pasco, Wash.	WC 3.8
32	35	Battle Creek, Mich.	NO 3.7
33	38	La Crosse, Wisc.	NO 3.7
34	15	Myrtle Beach, S. C.	PI 3.7
35	20	Redding, Calif.	PC 3.7
36		Burlington, Iowa	OZ 3.6
37	49	Land O'Lakes, Wisc.	NO 3.6
38	40	Columbia, Mo.	OZ 3.5
39	39	Columbus, Miss.	SO 3.5
40		Muncie, Ind.	LC 3.5
41	41	Oxnard, Calif.	PC 3.5
42	30	Bradford, Pa.	AL 3.4
43	16	Cape May, N. J.	AL 3.4
44		Franklin, Pa.	AL 3.4
45	36	Lewiston, Idaho	WC 3.4
46	34	Farmington, N. M.	FL 3.3
47		Green Bay, Wisc.	NO 3.2
48		Harlingen, Texas	TT 3.2
49		Johnstown, Pa.	AL 3.2
50		Altoona, Pa.	AL 3.1

Rank 1958	Rank 1957	City and State	Carrier	Passengers Boarded 1958	Passengers Boarded 1957	Percent Change 1958/57	Passengers Boarded Per Departure
207	183	Worcester, Mass.	MO	3,979	4,643	—16.7	1.9
208	204	*Natchez, Miss.	SO	3,924	3,849	1.9	1.7
209	212	Mason City, Iowa	OZ	3,899	3,527	10.5	3.0
210	197	*Bloomington, Ill.	OZ	3,883	4,045	— 4.2	2.8
211	180	*Santa Ana, Calif.	BL	3,836	4,700	—22.5	2.0
212	211	Dothan, Ala.	SO	3,831	3,554	7.8	2.8
213	219	*Houghton, Mich. (4)	NO	3,830	3,425	11.8	2.9
214	188	*Prescott, Ariz.	BL, FL	3,726	4,465	—19.8	1.1
215	206	*Athens, Ga.	SO	3,724	3,806	— 2.2	3.1
216	200	*Ephrata, Wash. (4)	WC	3,711	3,956	— 6.6	2.7
217	241	Waterloo, Iowa	OZ	3,661	2,738	33.7	2.6
218	213	Lafayette, La.	TT	3,623	3,526	2.7	5.2
219	195	*Marinette, Wisc. (4)	NO	3,596	4,073	—13.3	1.8
220	221	*Iron Mountain, Mich.	NO	3,445	3,528	5.7	2.1
221	217	Klamath Falls, Ore.	WC	3,377	3,452	— 2.2	4.9
222	203	Newport News, Va.	PI	3,365	3,876	—15.2	1.5
223	214	Mobile, Ala.	SO	3,244	3,502	— 8.0	5.0
224	220	*Corvallis, Ore. (4)	WC	3,230	3,297	— 2.1	1.5
225	194	*Roseburg, Ore.	WC	3,322	4,200	—26.4	1.9
226	242	*Pine Bluff, Ark.	TT	3,219	2,718	18.4	1.2
227	230	*Kokomo, Ind. (4)	LC	3,208	3,033	5.8	1.5
228	240	*Gallup, N. Mex.	FL	3,207	2,795	14.7	2.0
229	244	*Marion, Ill. (4)	OZ	3,198	2,687	19.0	2.5
230	218	Des Moines, Iowa	OZ	3,164	3,448	— 9.0	5.2
231	225	*Manitowoc, Wisc.	NO	3,145	3,167	— .7	2.1
232	232	*Grand Forks, N. D.	NO	3,110	2,963	5.0	2.7
233	266	Rochester, Minn.	OZ	3,039	2,058	47.7	1.7
234	209	New Bern, N. C.	PI	3,019	3,580	—18.6	2.6
235	216	*Salisbury, Md.	AL	3,019	3,482	—15.3	4.0
236	260	*Hazelton, Pa.	AL	3,008	2,141	40.5	3.1
237	285	*Ogdensburg, N. Y.	MO	2,994	1,613	85.6	4.2
238	245	*Tupelo, Miss.	SO	2,928	2,687	9.0	1.5
239	223	*Montrose, Colo.	FL	2,856	3,243	—13.5	2.0
240	226	*Ponca City, Okla.	CN	2,852	3,133	— 9.8	1.5
241	257	*Liberal, Kansas	CN	2,798	2,249	24.4	2.1
242	224	*Hickory, N. C.	PI	2,757	3,216	—16.6	1.5
243	236	*Moultrie, Ga.	SO	2,748	2,882	— 4.9	1.4
244	234	*Enid, Okla.	CN	2,734	2,923	— 6.9	1.5
245	231	*Santa Rosa, Calif.	PC	2,705	2,987	—10.4	2.1
246	267	*Bloomington, Ind.	LC	2,700	2,044	32.1	2.0
247	250	*Ironwood, Mich.	NO	2,687	2,471	8.7	1.6
248	252	*Marion, Ind.	LC	2,632	2,457	7.1	1.7
249	229	Greenville, S. C.	SO	2,607	3,071	—17.8	2.3
250	233	*Vernal, Utah	FL	2,562	2,933	—14.5	1.8
251	239	*Alamosa, Colo.	FL	2,531	2,798	—10.5	1.4
252	247	*Laramie, Wyo.	FL	2,511	2,647	— 5.4	1.3
253	314	*Norfolk, Neb.	NO, FL	2,461	1,227	100.6	1.8
254	237	Nashville, Tenn.	OZ	2,381	2,834	—19.0	6.6
255	238	*Marysville, Calif.	PC	2,372	2,800	—18.0	1.7
256	227	*Winslow, Ariz.	FL	2,362	3,112	—31.8	1.6
257	253	*Cody, Wyo.	FL	2,337	2,364	— 1.2	2.6
258	243	Springfield, Mass. (4)	MO	2,300	2,705	—17.6	1.8
259	251	*Worland, Wyo.	FL	2,296	2,465	— 7.4	1.4
260	235	*Glens Falls, N. Y.	MO	2,266	2,918	—28.8	2.3
261	269	*Brainerd, Minn.	NO	2,235	2,015	10.9	1.7
262	256	*Ottumwa, Iowa	OZ	2,224	2,273	— 2.2	1.9
263	259	*Bemidji, Minn.	NO	2,220	2,160	2.8	1.6
264	246	*Beckley, W. Va.	PI	2,198	2,671	—21.5	1.1
265	261	*Lufkin, Texas	TT	2,135	2,135	.0	1.5
266	308	*Apple Valley, Calif.	BL	2,129	1,276	66.8	2.1
267	279	*Silver City, N. Mex.	FL	2,119	1,685	25.8	1.9
268	262	*El Dorado, Ark.	TT	2,118	2,121	— .1	1.5
269	254	*Vicksburg, Miss.	SO	2,108	2,313	— 9.7	1.3
270	289	Amarillo, Texas	CN	2,068	1,563	32.3	3.4
271	268	*Clarksville, Tenn.	OZ	2,060	2,035	1.2	1.5
272	265	*Rock Springs, Wyo.	FL	2,044	2,067	— 1.1	1.4
273	248	Bartlesville, Okla.	CN	1,998	2,592	—29.7	1.6
274	249	*Cape Girardeau, Mo. (2)	OZ	1,982	2,547	—28.5	2.2
275	274	Fort Dodge, Iowa	OZ	1,959	1,884	4.0	2.1
276	258	*Borger, Texas	CN	1,895	2,242	—18.3	1.6
277	320	Sioux Falls, S. D.	NO	1,888	1,024	—84.4	1.7
278	294	Fargo, N. D.	NO	1,861	1,503	23.8	2.2
279	281	*Laurel, Miss.	SO	1,829	1,660	10.2	1.4
280	328	*Cape May, N. J. (3) (4)	AL	1,805	872	107.0	3.4
281	255	Sioux City, Iowa	NO, OZ	1,797	2,310	—28.5	1.6
282	301	*Muskogee, Okla.	CN	1,780	1,384	28.6	1.0
283	318	*Harrison, Ark.	CN	1,769	1,076	64.4	1.4
284	302	Pendleton, Ore.	WC	1,687	1,356	24.4	2.3
285	293	*Clintonville, Wisc.	NO	1,683	1,535	9.6	1.2
286	276	Owensboro, Ky.	OZ	1,662	1,717	— 3.3	1.7
287	297	*Portsmouth, Ohio	LC	1,643	1,434	14.6	1.4
288	306	*Mattoon, Ill. (4)	OZ	1,638	1,332	23.0	1.7
289	284	*Zanesville, Ohio	LC	1,620	1,619	.1	1.3
290	271	*Ukiah, Calif.	PC	1,589	1,959	—23.3	1.5
291	290	*Couer d'Alene, Idaho	WC	1,588	1,545	2.8	1.3
292	264	*Dover, Del.	AL	1,576	2,073	—31.5	2.2
293	263	*Williston, N. D.	FL	1,574	2,089	32.7	2.2
294	296	*Paris, Texas	CN	1,571	1,466	7.2	1.1
295	275	*Red Bluff, Calif.	PC	1,556	1,735	—11.5	1.2
296	272	Wilmington, Del.	AL	1,541	1,926	—25.0	2.4
297	304	*Burley, Idaho (4)	WC	1,515	1,337	13.3	1.0
298	288	*Blythe, Calif.	BL	1,510	1,579	— 4.6	1.1
299	287	*Richmond, Ind.	LC	1,485	1,585	— 6.7	1.1
300	309	*Winona, Minn.	NO	1,480	1,272	16.4	1.1
301	286	*Duncan, Okla.	CN	1,453	1,585	— 9.1	1.0
302	283	*London, Ky. (4)	PI	1,451	1,621	—11.7	1.4
303		*Muncie, Ind. (1) (4)	LC	1,406			3.5
304	291	*Myrtle Beach, S. C. (3)	PI	1,405	1,542	— 9.7	3.7
305	313	*Thief River Falls, Minn.	NO	1,378	1,243	10.9	1.1
306	298	*Clinton, Iowa	OZ	1,351	1,426	— 5.5	1.3
307	300	*Galveston, Texas	TT	1,346	1,415	— 5.1	1.0
308	312	*Gunnison, Colo.	FL	1,344	1,247	7.8	1.1
309		Cedar City, Utah	BL	1,325			2.0
310	270	*Marion, Ohio	LC	1,298	1,989	—53.2	.9
311	307	*Brownwood, Texas	TT	1,297	1,314	— 1.3	.9
312	292	*Dover, Ohio (4)	LC	1,297	1,536	—18.4	1.0
313	295	*Kingman, Ariz.	BL	1,238	1,493	—20.6	.9
314	355	*Guymon, Okla.	CN	1,236	538	129.7	1.0
315	303	*Greenwood, S. C.	SO	1,230	1,355	—10.2	1.0

(Continued on page 72)

Local Service Airline Schedu

Each line represents a round trip scheduled at least four days p[er] week.
of scheduling with Fairchild F-27, Convair and Mar[tin] equipm[ent]



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chedule Pattern—May, 1959

day's p eek, based on schedules in effect in May, 1959. To see extent
d Mart quipment as DC-3 replacements, see map on page 65.

Statistical Analysis of Local Service Air

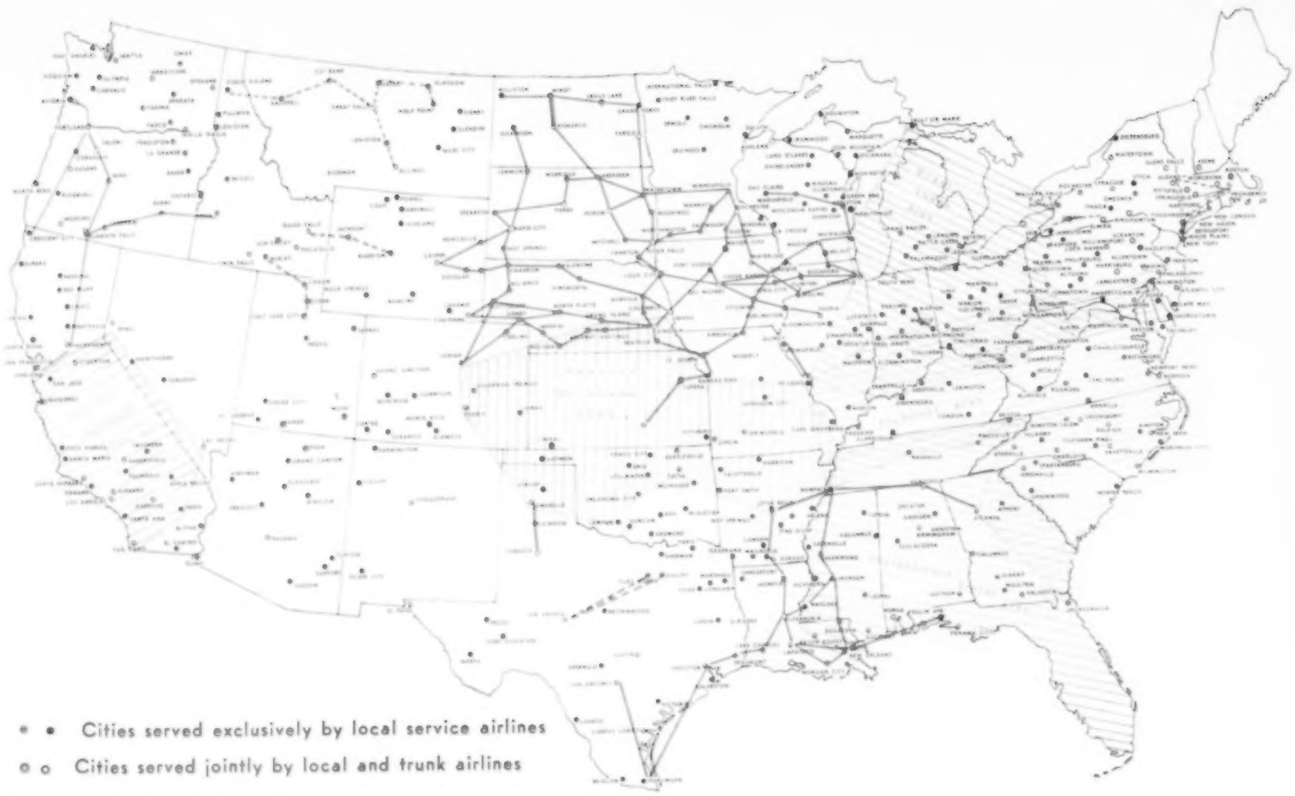
SELECTED REVENUES AND EXPENSES (Dollars in 000's)	Allegheny	Bonanza	Central	Frontier	Lake Central
Passenger Revenue	5,819	2,708	1,825	4,008	2,063
Total Non-Mail Revenue	6,171	2,861	1,984	4,480	2,172
Mail Pay	3,591	1,885	2,887	2,583	1,838
Total Revenue	9,762	4,746	4,871	7,063	4,010
Total Expense	9,357	4,674	4,694	7,454	3,869
Profit (or Loss)	405	72	177	(391)	141
Break-Even Need	3,186	1,813	2,710	2,974	1,697
SELECTED OPERATING STATISTICS					
Revenue Miles (000)	6,343	4,047	3,732	6,181	3,064
Originating Passengers	475,852	182,086	138,090	231,935	182,589
Enplaned Passengers	488,615	185,024	143,133	260,582	186,617
Revenue Passenger Miles (000)	84,196	42,336	26,872	62,704	29,289
Passenger Load Factor (%)	50.9	49.8	34.3	48.3	45.5
Revenue Ton-Miles (000)	8,639	4,238	2,780	7,037	3,025
Ton-Mile Utilization Factor (%)	47.6	43.6	31.0	47.4	41.1
REVENUE AND EXPENSES—Cents Per Revenue Mile					
Revenues:					
Passenger	91.75	66.92	48.90	64.84	67.33
Total Non-Mail	97.29	70.72	53.17	72.48	70.87
Mail Pay	56.62	46.58	77.35	41.79	59.99
Total Revenue	153.91	117.30	130.52	114.27	130.86
Expenses:					
Flying Operations	48.84	35.08	39.33	38.27	39.79
Total Maintenance	28.69	22.94	22.83	23.01	23.21
Passenger Service	6.57	5.48	5.77	6.30	5.85
Aircraft and Traffic Service	35.01	28.50	37.19	31.48	35.52
Promotion and Sales	13.37	8.46	9.35	9.79	9.10
General and Administrative	8.00	9.28	7.57	8.53	9.12
Depreciation and Armortization	7.04	5.76	3.74	3.22	3.65
Total Expense	147.52	115.50	125.78	120.60	126.24
Profit (or Loss)	6.39	1.80	4.74	(6.33)	4.62
Break-Even Need	50.23	44.78	72.61	48.12	55.37
SELECTED REVENUE AND EXPENSES—Cents Per Ton-Mile					
Total Non-Mail Revenue	71.4	67.5	71.4	63.7	71.8
Total Expense	108.3	110.3	168.8	105.9	127.9
Break-Even Need	36.9	42.8	97.4	42.2	56.1
ADDITIONAL OPERATING STATISTICS					
Scheduled Miles (000)	6,753	4,020	3,755	6,183	3,094
Completion Factor (%)	93.2	99.6	97.7	98.9	98.3
Average Passenger Load	13.3	10.5	7.2	10.1	9.6
Average Journey:					
Originating Passenger	177	233	195	270	160
Enplaned Passenger	172	229	188	241	157
Revenue Ton-Miles:					
Passenger (000)	7,999	4,020	2,549	5,957	2,787
U. S. Mail	139,042	64,515	66,361	230,449	43,291
Express and Freight	460,393	124,538	141,839	773,534	174,266
Excess Baggage	40,746	28,876	22,901	75,602	19,585
Average Ton Load	1.36	1.05	0.75	1.14	0.99
Ton-Miles of Surface Mail	8,332	28,576	5,581	87,907	2,234
Total Revenue Hours	43,852	26,751	25,286	41,293	21,887
Average Flying Speed (MPH)	144.6	151.3	147.6	149.7	140.0
Type(s) of Aircraft Operated	202/DC-3	DC-3	DC-3	DC-3	DC-3
Number of Aircraft Operated	23	10	14	17	10
Daily Aircraft Utilization	5:19	7:20	5:16	7:14	6:00
Unduplicated Route Mileage in Operations	2,154	2,076	3,548	4,080	1,961
Daily Route Mile Turnover (4th Quarter)	8.0	5.3	3.0	4.2	4.4
Tons of Cargo Carried:					
U. S. Mail	885	293	412	749	343
Express	1,393	187	247	298	1,181
Freight	1,418	523	580	1,917	
Gallons of Fuel Consumed (000)	6,128	2,836	2,716	4,541	2,357
Number of Actual Departures	77,115	32,257	45,430	62,560	43,920
Departures Per Day	211	88	125	171	120
Per Actual Departure:					
Revenue Miles	82.3	125.5	82.1	98.8	69.8
Enplaned Passengers	6.3	5.7	3.2	4.2	4.2
Revenue Passenger Miles	1,092	1,312	592	1,002	667
Number of Employees (Average)	851	419	447	821	400
Per Employee:					
Revenue Miles	7,453	9,658	8,348	7,529	7,661
Enplaned Passengers	574	442	320	317	467
Revenue Passenger Miles (000)	98.9	101.0	60.1	76.4	73.2
ADDITIONAL FINANCIAL DATA					
Ratio-Total Expense to Non-Mail Revenue	1.52	1.63	2.37	1.66	1.78
Non-Mail Revenue Per:					
Actual Departures (Dollars)	80.02	88.71	43.67	71.61	49.45
Employee (Dollars)	7,251	6,830	4,439	5,456	5,429
Passenger Revenue Per:					
Originating Passenger (Dollars)	12.26	14.98	13.34	17.72	11.35
Enplaned Passenger (Dollars)	11.94	14.79	12.87	15.75	11.10
Revenue Passenger Miles (Cents)	6.92	6.46	6.88	6.48	7.10

*Estimated.

Airline Operations For 1958

Mohawk	North Central	Ozark	Pacific	Piedmont	Southern	Trans-Texas	West Coast	Total or Average
6,419	8,672	5,028	4,534	6,139	2,799	3,548	2,927	56,489
6,852	9,329	5,435	4,941	6,670	2,950	3,934	3,064	60,843
2,805	3,564	2,830	2,239	2,583	2,473	3,071	1,909	34,258
9,657	12,893	8,265	7,180	9,253	5,423	7,005	4,973	95,101
8,931	12,988	7,988	7,263	8,919	5,102	6,634	5,458	93,331
726	(95)	277	(83)	334	321	371	(485)	1,770
2,079	3,659	2,553	2,322	2,249	2,152	2,700	2,394	32,488
5,040	11,263	6,352	5,384	7,807	4,076	6,162	4,104	73,555
453,765	746,496	423,785	375,718	410,891	222,956	240,439	248,436	4,333,038
495,140	777,140	431,268	394,771	448,005	226,230	252,931	294,200	4,583,656
87,291	125,931	72,578	83,468	86,435	41,818	54,934	46,520	844,372
58.0	53.2	54.4	54.1	52.0	48.9	42.4	50.7	50.5
8,771	12,792	7,465	8,246	8,755	4,333	5,875	4,634	86,590
54.5	47.3	49.0	49.5	46.2	44.3	39.7	44.8	46.1
127.37	77.00	79.16	84.20	78.64	68.68	57.57	71.32	76.80
135.96	82.83	85.57	91.78	85.44	72.37	63.83	74.66	82.72
55.65	31.64	44.55	41.59	33.08	60.68	49.83	46.50	46.57
191.61	114.47	130.12	133.37	118.52	133.05	113.66	121.16	129.29
50.28	37.22	36.78	44.04	38.00	36.98	32.86	43.02	39.79
39.39	21.96	24.94	32.68	22.50	23.77	22.49	22.53	25.25
7.28	6.25	6.42	5.33	6.64	5.51	5.33	6.58	6.16
38.98	32.22	33.56	28.69	31.44	35.48	28.34	32.52	32.69
11.47	7.46	9.91	7.66	8.02	10.86	8.72	13.08	9.55
14.79	4.99	6.89	7.99	4.82	7.42	5.78	8.82	7.54
15.02	5.22	7.26	8.51	2.82	5.14	4.13	6.44	5.91
177.21	115.32	125.76	134.90	114.24	125.16	107.65	132.99	126.89
14.40	(0.85)	4.36	(1.53)	4.28	7.89	6.01	(11.83)	2.40
41.25	32.49	40.19	43.12	28.80	52.79	43.82	58.33	44.17
78.1	72.9	72.8	59.9	76.2	68.1	67.0	66.1	70.3
101.8	101.5	107.0	88.1	101.9	117.7	112.9	117.7	107.8
23.7	28.6	34.2	28.2	25.7	49.6	45.9	51.6	37.5
5,084	11,038	6,271	5,113	7,824	4,085	6,168	4,205	73,593
94.7	98.2	98.5	98.3	98.1	98.1	97.7	96.3	97.5
17.3	11.1	11.4	15.5	11.1	10.3	9.0	11.4	11.5
192	169	171	222	210	188	228	187	195
176	162	168	211	193	185	217	158	184
8,293	11,992	6,893	7,929	8,211	3,973	5,219	4,420	80,242
92,657	302,144	131,418	135,624	170,815	111,436	176,654	56,189	1,720,595
345,596	406,476	401,782	149,198	298,478	211,877	432,870	134,848	4,055,695
40,380	91,862	38,173	31,564	73,980	37,581	46,980	23,537	571,767
1.74	1.14	1.18	1.53	1.12	1.06	0.95	1.13	1.18
11,779	83,770	13,475	37,061	59,762	6,011	33,839	10,712	389,040
32,900	79,184	45,003	33,889	53,182	27,854	39,109	29,630	499,820
153.2	142.2	141.1	158.9	146.8	146.3	157.6	138.5	147.2
240/DC-3	DC-3	DC-3	202/DC-3	F-27/DC-3	DC-3	DC-3	F-27/DC-3	
21	31	24	19	23	16	20	19	247
4:37	7:32	5:56	4:58	6:49	5:27	5:21	5:19	5:55
1,908	3,510	3,557	1,712	2,748	2,753	3,556	2,322	35,885
7.5	8.7	5.1	9.1	7.8	4.3	4.8	4.6	5.7
567	1,890	813	894*	784	627	753	345	9,355
893	2,660	1,410	415*	783	653	483	179	10,782
1,089		1,266	551*	696	464	1,299	561	10,364
5,302	8,073	4,322	5,260*	5,891	2,934	3,982	3,586	57,928
52,437	139,835	73,715	58,222	92,780	51,896	75,949	57,658	863,774
144	383	202	160	254	142	208	158	2,366
96.1	80.5	86.2	92.5	84.1	78.5	81.1	71.2	85.2
9.4	5.6	5.9	6.8	4.8	4.4	3.3	5.1	5.3
1,665	901	985	1,434	932	806	723	807	978
717	1,354	800	527	914	535	666	530	8,981
7,029	8,318	7,939	10,216	8,542	7,619	9,253	7,744	8,190
691	574	539	749	490	423	380	555	516
121.7	93.0	90.7	158.4	94.6	76.7	82.5	87.8	94.0
1.30	1.39	1.47	1.47	1.34	1.73	1.69	1.78	1.53
130.67	66.72	73.73	84.87	71.89	56.85	51.79	53.14	70.44
9,557	6,890	6,794	9,376	7,298	5,514	5,906	5,792	6,776
14.44	11.75	12.01	12.88	15.04	12.62	15.03	12.00	13.25
13.21	11.29	11.80	12.22	13.79	12.43	14.27	10.10	12.52
7.55	7.38	7.19	5.79	7.20	6.77	6.68	6.35	6.89

—(FLIGHT MAGAZINE Compilation by Ray & Ray)



The Expanding Local Air Service Map

FOR the first time the effects of the Civil Aeronautics Board's local service area investigations can begin to be visualized. They are charted vividly on the FLIGHT MAGAZINE map above by E. H. and M. A. Pickering.

The Board's final decisions are completed in three major cases — the Seven States Area Case, the Pacific Northwest Area Case, and the South Central Area Case. The Pacific Northwest Area Case was decided as recently as May 29. As a result of these three cases alone, seven of the locals have received extensive new mileage and first air service has been authorized to 28 cities out of the 98 cities affected by these route awards. Trunkline services at 20 cities have been transferred completely to local service.

What Map Shows

New routes, awarded in the past twelve months, are shown on the above map by solid red lines. Red dots, not connected by lines, are cities newly added as intermediate points on existing local service routes. Solid red dots are cities newly added and served by locals exclusively. Hollow red circles are newly added cities served jointly with trunk airlines. Dots and circles in black are cities already on the local service map prior to decisions of the past twelve months.

Shown in red are some routes and cities which had been tentatively served by the locals prior to these decisions, but whose continuance depended upon the Board decisions in these cases.

In addition to the three area cases named above, decisions in two limited-area cases and in four exemption proceedings are also shown in solid red lines.

"Press release decisions" (in effect considered as tentative decisions by the CAB) have been made public in the Montana Area Case and in the Northeastern States Case, and are shown on the map by broken red lines. Four locals are to be expanded by these tentative decisions; two of the locals will be further extended by these decisions in addition to awards already received in the three area cases already decided. These tentative decisions involve first service to five cities, out of a total of 37 cities affected, and complete trunk suspension at eight cities.

Also shown by a broken red line is a new local service authorization in Texas resulting from a press release decision of a part of the controversial trunkline Dallas-to-the-West Case.

Five additional area proceedings are currently under way, and two more are to be set for proceedings in the near future. The five that are under way are shown on the map above in blue cross-hatching representing the official boundaries of the areas covered by the proceedings. Current status of these five cases is listed below:

Great Lakes Area Case — awaiting initial decision by examiner.

Kansas-Oklahoma Area Case — awaiting initial decision by examiner.

Pacific Southwest Area Case — briefs to examiner due August 10, 1959.

Piedmont Area Case — briefs to examiner due July 31, 1959.

Southeastern Area Case — awaiting Board decision.

Press Release decision in the Montana Area Case was issued December 5, 1958, and in the Northeastern Area Case on May 19, 1959.

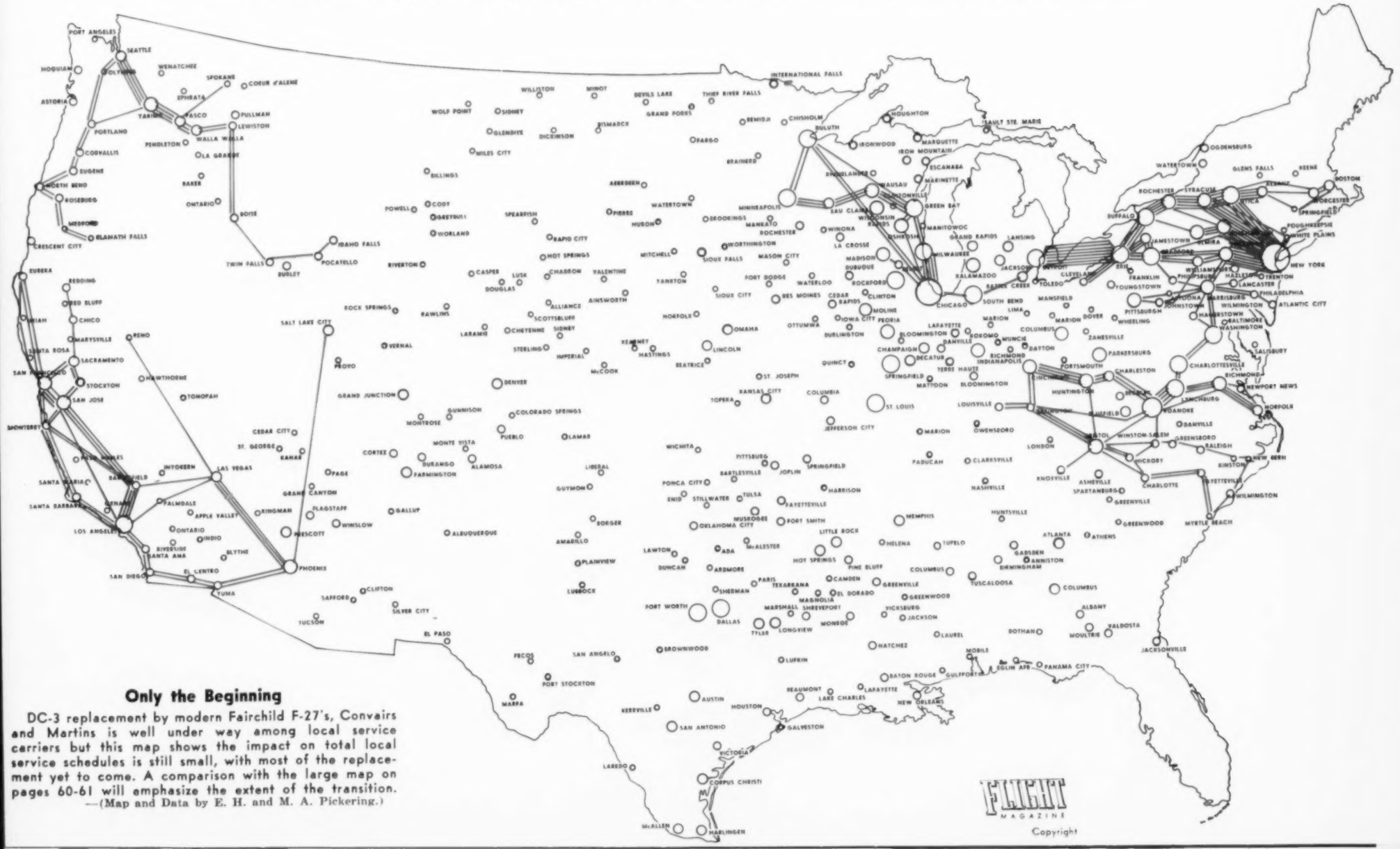
The two area cases yet to get under way have tentatively been termed the Texas Area Case and the Arizona-New

(Continued on page 72)

Local Service Airline Schedule Pattern Operated With Equipment Other Than DC-3's

May, 1959

Red lines show round trip frequencies by Fairchild F-27's. Blue lines show round trip frequencies by Convairs and Martins.



Only the Beginning

DC-3 replacement by modern Fairchild F-27's, Convairs and Martins is well under way among local service carriers but this map shows the impact on total local service schedules is still small, with most of the replacement yet to come. A comparison with the large map on pages 60-61 will emphasize the extent of the transition.

—(Map and Data by E. H. and M. A. Pickering.)

More airlines
fly **FAIRCHILD**
F-27s
than any other
Jet Age
airliner

Profitmaker Propjet

FAIRCHILD F-27

First American turbine-powered transport to enter scheduled airline service and the first to begin business flying operations, the Fairchild F-27 is profit-making daily for airlines and major corporations in North and South America. Combining the ultimate in propjet performance and economy with matchless comfort, the F-27 pays off in profits . . . whether its payload is up to 44 airline passengers or business personnel or cargo.

FAIRCHILD F-27

First in Airline Service

The Fairchild F-27 twin-propjet occupies an enviable position in the new Jet Age. First in service in the United States, Canada and South America, the F-27 won immediate acclaim as a profit-making short and medium range airliner. Reports of increased traffic—up to 200 percent on some segments—follow wherever the F-27 performs.

Its distinctive high-wing design—which in flight provides the best view in the air—has quickly become a symbol of swift, dependable, luxurious flying at Main Street airports as well as major air terminals. The 40-passenger, air-conditioned and pressurized F-27 provides comfort matched only by the superb smoothness of flight.

The ultimate in aerodynamic engineering and the propjet power and reliability of Rolls-Royce Dart engines have teamed to prove the F-27's dependability under all operating conditions.

Passenger appeal and unmatched performance has clearly established the F-27 as the pacesetter of the Jet Age.

Look for the Fairchild F-27 on these progressive airlines: AREA, AVENSA, Aloha Airlines, Bonanza Air Lines, Northern Consolidated Airlines, Ozark Air Lines, Pacific Air Lines, Piedmont Airlines, Quebecair, Trans Mar de Cortes, West Coast Airlines, Wheeler Airlines, and Wien Alaska Airlines.

...ce, Dependability, Luxury

FEATURES

- Short field capability unmatched by any other aircraft in its class
- Propjet power and reliability
- Unsurpassed single-engine performance
- High-wing visibility
- Unobstructed view through panoramic windows from every seat
- Vibrationless flight . . low cabin sound levels
- Weather radar for turbulence avoidance
- Air conditioning—on ground as well as in flight
- Pressurization
- Luxurious passenger-ease interiors
- Self-contained passenger loading stairs

PERFORMANCE

	R. Da. 6 Mark 511	R. Da. 7 Mark 528
Cruising Speed	272 mph	300 mph
Effective Range: (with 45 minute fuel reserve)		
Airline	1,700 miles	1,570 miles
Corporate	2,290 miles	2,115 miles
Rate of Climb: (S.L.)		
Normal Power	1,335 fpm	1,920 fpm
Single Engine	490 fpm	620 fpm
Take-Off Field Length at 36,225 lbs. Gross Weight	4,100 feet	3,075 feet
Landing Field Length (34,500 lbs.)	3,580 feet	3,580 feet
Stall Speed at Maximum Landing Weight	78 mph	78 mph
Service Ceiling (Single Engine)	15,185 feet	16,358 feet

SPECIFICATIONS

Wing Span	95 ft. 2 in.
Length	77 ft. 2 in.
Height	27 ft. 6 in.
Maximum Take-Off Weight	36,225 lbs.
Maximum Landing Weight	34,500 lbs.
Pressurization	4.16 p.s.i.
Engines:	
Two Rolls-Royce RDa 6 Darts, each rated at	1,720 t.e.h.p.
OR	
Two Rolls-Royce RDa 7 Darts, each rated at	2,105 t.e.h.p.

Turns time enroute to time on the job

The first US turbine-powered transport to go to work for business in the Jet Age, the Fairchild executive F-27 is a full-time, full-size business transport. Exceptional short-field capability makes the F-27 a full-time business machine able to utilize hundreds of small off-airways airports previously closed to craft of the F-27's size. Yet, the F-27's spacious, full-size interior provides for dual payloads of staff personnel and priority cargo. Air-conditioning and pressurization duplicate in the F-27 the comfort and efficiency of the home office . . . truly turning time enroute to time on the job.

FAIRCHILD ENGINE AND AIRPLANE CORPORATION

Hagerstown, Maryland

MEMO

from J. H. Carmichael, *President*
FAIRCHILD ENGINE AND AIRPLANE CORPORATION

The Fairchild F-27 has clearly demonstrated in the past nine months that it is a business-getter for local service airlines, and a traffic generator for all airlines. It is increasing payloads and revenues. One carrier, for example, reports revenues up 34.8 percent in six months of operating the F-27 while another reports a 23 percent traffic increase.

The F-27 is not a hand-me-down or a makeshift conversion. It was designed for the job it is doing so well. It has to be rugged to perform for operators who call upon it to make a take off and landing during every 30 minutes of operation. An enviable record of reliability is being established by F-27s accumulating more than 1000 hours a week in scheduled operations.

The F-27 has passenger appeal. Passengers like it and recognize it as an integral part of the new first-class-all-the-way Jet Age air traffic system.

The Fairchild propjet will enable local service airlines to cast aside the role of "poor cousins" and to play an even more dramatic part in the continuing growth of air travel that has revolutionized American industry and recreation. It is actually creating new patterns of short and medium-haul travel--providing a new flexibility that multiplies the potential of local airlines.

Fairchild is proud of its F-27--and proud that it is playing an important part in the ever-expanding air transportation industry.

EXPANDING LOCAL SERVICE MAP

(Continued from page 64)

Mexico Area Case. These two will bring to twelve the total cases which, combined, blanket almost the entire country with an intensive and comprehensive analysis of the local service needs of the nation.

By this time next year, final decisions in at least five, and possibly as many as seven of the above named cases should be announced. If so, several thousand new route miles and over 200 cities can be expected to receive additional or first services from the local service airlines.

Still other proceedings affecting several of the locals recently got under way. These proceedings will be the first to give the locals an international flavor, as they encompass service possibilities extending into several Canadian cities from Vancouver on the west to Toronto on the east. Some five cases could result in at least five route extensions terminating in Canadian cities.

Nor will all of this activity see an end to local service expansion for, just as these cases have been in the procedural mill for over three years thus far, by the time the last case is decided the growth in economy of many smaller cities and new relations between cities presently served, plus the potential effect of jet operations causing the trunks to want to divest themselves of many smaller cities they are presently serving will create a new rash of cases as the dynamic local service industry strives to keep up with changing conditions.

1958 Traffic Record at Local Service Stops

(Continued from page 59)

Rank 1958	Rank 1957	City and State	Carrier	Passengers Boarded 1958	Passengers Boarded 1957	Percent Change 1958/57	Passengers Per Departure
316	322	Waco, Texas	TT	1,223	1,005	21.7	1.2
317	364	*Palmdale, Calif. (4)	PC	1,142	450	153.8	1.0
318	380	*Yankton, S. D.	NO	1,127	4		1.0
319	311	*Miles City, Mont.	FL	1,085	1,249	—15.1	1.5
320	321	*Southern Pines, N. C. (3) (4)	PI	1,023	1,015	.8	1.8
321	277	Spartanburg, S. C.	SO	1,017	1,711	—68.2	.9
322	344	Toledo, Ohio	LC	987	647	52.5	.8
323	337	Temple, Texas	TT	957	759	26.1	1.0
324	280	*Trenton, N. J.	AL	957	1,664	—73.9	.9
325	282	Colorado Springs, Colo.	CN	950	1,632	—71.8	1.7
326	319	*Monte Vista, Colo.	FL	944	1,032	— 9.3	.7
327	310	*Olympia, Wash.	WC	922	1,260	—36.7	1.2
328	324	*Camden, Ark.	TT	903	961	— 6.4	.8
329	299	Stockton, Calif.	PC	883	1,425	—61.4	1.0
330	332	El Paso, Texas	TT	881	821	7.3	3.0
331	358	*Marshall, Texas	TT	859	522	64.6	.7
332	325	*Powell, Wyo.	FL	805	943	—17.1	1.1
333	333	*Land O'Lakes, Wisc. (3)	NO	785	821	— 4.6	3.6
334	360	*Wolf Point, Mont.	FL	777	506	53.6	1.1
335	305	Bismarck, N. C. (4)	FL	772	1,332	—72.5	2.1
336	330	Danville, Va.	PI	760	849	—11.7	1.2
337	339	*Ontario, Ore.	WC	727	726	.1	1.0
338	341	*Magnolia, Ark.	TT	695	706	— 1.6	.6
339	317	*Glendive, Mont.	FL	694	1,198	—72.6	1.0
340	329	*Pittsburg, Kansas	OZ	691	872	—26.2	1.0
341	375	*Lamar, Colo.	CN	690	167	313.2	1.2
342	336	*Stillwater, Okla.	CN	679	771	—13.5	1.2
343	327	*Rawlins, Wyo.	FL	676	879	—30.0	1.0
344		Sault Ste. Marie, Mich. (1)	NO	667			2.6
345	340	*Sidney, Mont.	FL	654	716	— 9.5	.9
346	362	*McAlester, Okla.	CN	653	474	37.8	1.0
347	316	Keene, N. H.	MO	625	1,201	—92.2	1.1
348	323	*Safford, Ariz.	FL	623	984	—57.9	.9
349	334	*Kerrville, Texas	TT	604	814	—34.8	.5
350	350	*Greybull, Wyo.	FL	586	563	4.1	.9
351	359	Watertown, S. D.	NO	586	512	14.4	.8
352	353	*Baker, Ore.	WC	578	539	7.2	.9
353	349	*Ada, Okla.	CN	576	586	— 1.7	1.0
354	366	Brookings, S. D.	NO	574	415	38.3	.7
355	343	*Marfa, Texas (4)	TT	572	657	—14.9	1.0
356	356	*Cumberland, Md.	AL	529	531	— .4	1.9
357	331	*Beeville, Texas (2)	TT	518	822	—58.7	.4
358	354	*Pecos, Texas	TT	509	539	— 5.9	.9
359	358	*Easton, Md.	AL	503	739	—47.0	1.2
360		Huntsville, Ala.	SO	479			8.0
361	357	*Fort Stockton, Texas	TT	476	524	—10.1	.8
362	347	*La Grande, Ore.	WC	466	599	—28.5	.8
363	351	*Ardmore, Okla.	CN	428	550	—28.5	.7
364	342	*Lock Haven, Pa.	AL	424	693	—63.4	.8
365	335	*Sherman, Texas	CN	417	780	—87.0	.7
366		*Provo, Utah	BL	404			.7
367		*Lincoln, Neb. (1)	FL	396			2.3
368	348	*Tonopah, Nev.	BL	380	589	—55.0	.8
369	363	*Morehead City, N. C. (3)	PI	353	453	—28.3	4.2
370		*Greenwood, Miss. (1)	SO	350			2.0
371	368	*Helena, Ark. (4)	TT	319	382	—19.7	.5
372	352	*Dickinson, N. D.	FL	309	549	—77.0	.4
373	372	*McCall, Idaho (3)	WC	294	248	18.5	1.7
374	279	*Hawthorne, Nev.	BI	279	439	—57.3	.7
375	371	*Clifton, Ariz.	FL	276	276	.6	.5
376	361	*Chehalis, Wash. (2) (4)	WC	254	492		.7
377	345	Baltimore, Md.	AI	229	614	—168.1	.8
378		*Chadron, Neb. (1)	FL	229			1.3
379		*Ainsworth, Neb. (1)	FL	227			1.6
380	373	*Brady, Texas	TT	222	241	— 8.5	.8
381	346	*Ellensburg, Wash. (2)	WC	202	610		.6
382		*Valentine, Neb. (1)	FL	180			1.6
383	278	*Indio, Calif. (2) (4)	BL	139	1,701		1.6
384		*Anniston, Ala. (1)	SO	131			1.4
385	376	*Stuttgart, Ark.	TT	130	376	—19.2	.2
386	370	*Georgetown, Md. (3)	AL	105	287	—173.3	1.8
387	369	College Station, Texas (2) (4)	TT	95	303		.5
388		*Lusk, Wyo. (1)	FL	70			.4
389	367	Pittsfield, Mass. (2)	MO	34	409		.4
390		*Douglas, Wyo. (1)	FL	26			.2
391	326	*Yreka, Calif. (2)	PC	11	924		.5
392	374	*Gary, Ind. (2)	LC	4	218		.2

LOCAL SERVICE AIRLINES
Comparison of Total Non-Mail Revenue
(Cents Per Revenue Mile)
1957 - 1958

Carrier	1957	1958	% Increase
Allegheny	85.36	97.29	13.98
Bonanza	65.92	70.72	7.28
Central	46.91	53.17	13.34
Frontier	69.89	72.48	3.71
Lake Central	60.22	70.87	17.69
Mohawk	110.82	135.96	22.69
North Central	82.89	82.83	(0.07)
Ozark	70.09	85.57	22.09
Pacific	90.08	91.78	1.89
Piedmont	77.36	85.44	10.44
Southern	61.48	72.37	17.71
Trans-Texas	58.05	63.83	9.96
West Coast	64.61	74.66	15.55
Average	74.91	82.72	10.44

LOCAL SERVICE AIRLINES
Comparison of Break Even Needs
(Cents Per Revenue Mile)
1957 - 1958

Carrier	1957	1958	Decrease
Allegheny	47.37	50.23	(2.86)
Bonanza	46.01	44.78	1.23
Central	78.56	72.61	5.95
Frontier	47.26	48.12	(0.86)
Lake Central	66.81	55.37	11.44
Mohawk	50.71	41.25	9.46
North Central	30.08	32.49	(2.41)
Ozark	50.19	40.19	10.00
Pacific	42.72	43.12	(0.40)
Piedmont	32.92	28.80	4.12
Southern	55.55	52.79	2.76
Trans-Texas	46.23	43.82	2.41
West Coast	46.84	58.33	(11.49)
Average	46.19	44.17	2.02

LOCAL SERVICE AIRLINES
Comparison of Total Operating Expense
(Cents Per Revenue Ton-Mile)
1957 - 1958

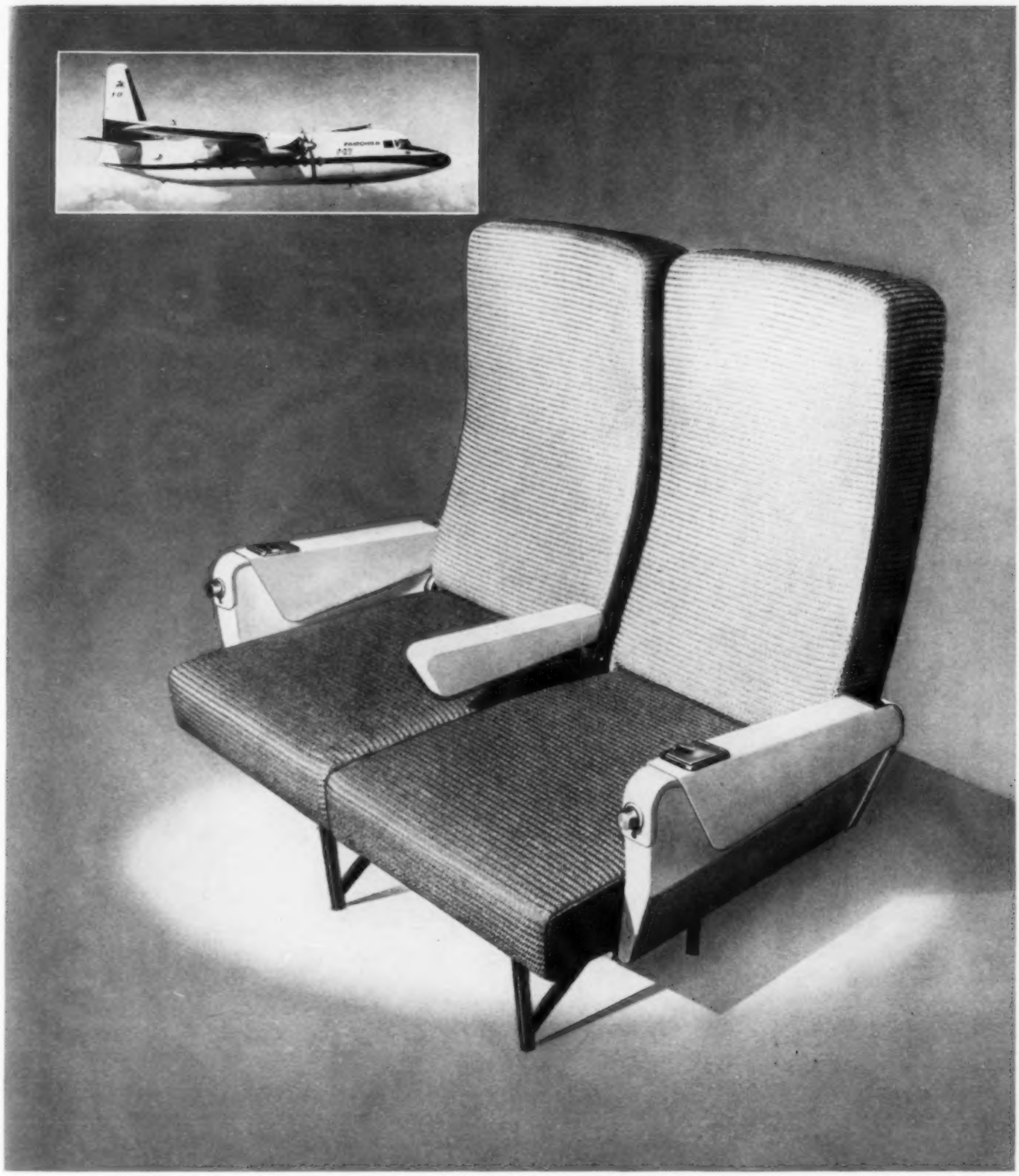
Carrier	1957	1958	Decrease
Allegheny	108.5	108.3	0.2
Bonanza	107.0	110.3	(3.3)
Central	173.5	168.8	4.7
Frontier	96.9	105.9	(9.0)
Lake Central	133.7	127.9	5.8
Mohawk	103.9	101.8	2.1
North Central	98.9	101.5	(2.6)
Ozark	112.8	107.0	5.8
Pacific	83.9	88.1	(4.2)
Piedmont	96.6	101.9	(5.3)
Southern	116.5	117.7	(1.2)
Trans-Texas	112.3	112.9	(0.6)
West Coast	101.0	117.7	(16.7)
Average	105.6	107.8	(2.2)

LOCAL SERVICE AIRLINES
Comparison of Passengers Enplaned
1957 - 1958

Carrier	1957	1958	% Increase
Allegheny	456,148	488,615	7.1
Bonanza	154,955	185,024	19.4
Central	123,072	143,133	16.3
Frontier	247,803	260,582	5.2
Lake Central	165,448	186,617	12.8
Mohawk	452,194	495,140	9.5
North Central	680,930	777,140	14.1
Ozark	399,337	431,268	8.0
Pacific	356,121	394,771	10.9
Piedmont	436,328	448,005	2.7
Southern	216,615	226,230	4.4
Trans-Texas	256,088	252,931	(1.2)
West Coast	290,882	294,200	1.1
Totals	4,235,921	4,583,656	8.2

LOCAL SERVICE AIRLINES
Comparison of Revenue Passenger Miles Flown
1957 - 1958

Carrier	(000) 1957	(000) 1958	% Increase
Allegheny	77,011	84,196	9.3
Bonanza	33,044	42,336	28.1
Central	23,726	26,872	13.3
Frontier	59,343	62,704	5.7
Lake Central	25,549	29,289	14.6
Mohawk	81,405	87,291	7.2
North Central	106,723	125,931	18.0
Ozark	63,835	72,578	13.7
Pacific	72,994	83,468	14.3
Piedmont	83,808	86,435	3.1
Southern	38,318	41,818	9.1
Trans-Texas	55,330	54,934	(0.7)
West Coast	45,128	46,520	3.1
Totals	766,214	844,372	10.2



AEROSMITH • ENGINEERS • DESIGNERS • MANUFACTURERS OF SEATS AND GALLEYS

More than 67 airlines operating throughout the world are equipped with Aerosmith seats and galleys . . . Aerosmith Products has designed and produced passenger seats for 34 of the 47 Fairchild F-27's delivered as of May 1 for airline use.

Aerosmith PRODUCTS • L. B. SMITH AIRCRAFT CORPORATION • INTERNATIONAL AIRPORT • MIAMI, FLORIDA

LOCAL SERVICE PROGRESS

(Continued from page 53)

ice. This means extra expense for the carriers involved. It is not a good or practical answer or solution to the CAB's problems in political areas. In the Seven States Decision, CAB certified quite a few small towns and probably went too far in some cases.

Stability in Earnings

It doesn't require a financial wizard to figure that something must be basically wrong with a government policy that has not permitted a Federally-regulated industry a fair profit or a chance to build up normal equity since its inception over a decade ago. If the local carriers had been permitted an earnings record for the past ten years, it is conceivable that they might now be self sufficient. But they were kept in a perpetual state of pauperism and peonage from which they are just now beginning to emerge.

The Civil Aeronautics Board has started to bring about the "reforms" so necessary to ultimate economic freedom. The Board sponsored and supported the guaranteed loan legislation, but it wasn't enough. Nearly everyone agrees that the limit should be $10,000,000 instead of $5,000,000 and that it should provide a full 100% guarantee rather than 90%.

Likewise the Board is moving toward the recognition of a sensible profit motive as evidenced in the increase from 8 to 9.5% in rate of return allowance as provided in the Mohawk and Southern mail rate cases last year. But rate of return is meaningless unless the carriers receive it. The Board deserves commendation for directing its staff to produce a new rate concept which has the dual purpose of not only establishing a definite criterion on which the airlines can operate and consequently know what profit they are going to receive, but even more important, receive their mail pay when it is due. The temporary mail rate system is a makeshift arrangement and it is hoped the staff study will result in a concrete program being adopted by the July 1 deadline. By whatever name a "formula" may be called, a fair return is the main requirement of any process which might be used. The Board's administrative attitude is, after all, the determining factor. No amount of avoiding the issue or complicating a formula can ever make an unfair attitude otherwise.

The CAB also deserves commendation for recent decisions on the matter of removing certain operating restrictions on the locals. Given more flexibility in the matter of skip-stop and frequency, the carriers will be permitted to develop traffic potential to the fullest without hurting the trunklines. Only one trunk carrier remains adamant on the subject of giving up the smaller markets to the locals. Those trunks which have resisted the inevitable are showing more willingness to turn over smaller points to the locals and avoid fighting for new small cities which logically fit the local service picture. It is high time the Board took the initiative and ordered certain markets not receiving adequate service from the trunks turned over to local carriers.

The whole point in these considerations of Board policy is just how can the drive toward self-sufficiency be accelerated? If the CAB will clean up the mail rate situation and adopt a firm fiscal policy that permits the carriers to earn money, equity capital from investors is a cinch. Without earnings, or the prospect of earnings, the carriers can never hope to attract equity capital in the quantities needed to achieve self-sufficiency. While this is not the only problem facing the locals at mid-year, it certainly is the major one and apparently the one big problem the CAB is diligently working on.

Local Service Airlines Selected Route Pattern Data As of December 1958

Carrier	Population Served (1958) (000)	Number of Cities Served			Route Miles	Average Segment Length
		Total	Exclusive Local Service	% of Total Exclusive		
Allegheny	18,041.3	55	24	43.6	2,154	58.2
Bonanza	3,692.0	26	16	61.5	2,076	94.4
Central	4,969.7	37	17	45.9	3,548	86.5
Frontier	2,206.4	58	42	72.4	4,080	81.6
Lake Central	12,016.1	41	18	43.9	1,961	59.4
Mohawk	13,631.8	34	8	23.5	1,908	83.0
North Central	9,860.3	62	36	58.1	3,510	68.8
Ozark	10,411.3	54	21	38.9	3,557	79.0
Pacific	4,115.2	33	20	60.6	1,712	65.8
Piedmont	4,730.7	53	14	26.4	2,748	72.3
Southern	3,839.1	35	15	42.9	2,753	78.7
Trans-Texas	5,313.6	51	29	56.9	3,556	80.8
West Coast	1,619.7	43	27	62.8	2,322	68.3
Total (unduplicated)	51,907.7	516	283	54.8	35,586	75.1

—(Ray & Ray Compilation)

A fifth local service carrier, Ozark Air Lines, will soon be operating F-27's and its passengers will see St. Louis as pictured above through the large under-wing windows of the Fairchild propjet.

F-27 SUCCESS

(Continued from page 55)

flown, 147 non-revenue hours flown, 3,698:15 total flying hours, and 4:56 hrs. average daily revenue utilization.

For month of April, 1959 (30 days, 180 plane days):

Plane No.	Rev. Hrs.	Non-Rev. Hrs.	Total Flying Hrs.	Avg. Dly. Rev. Util.
701	158:21	15:53	174:14	5:17
702	161:56	1:24	163:20	5:24
703	129:40	3:57	133:37	4:19
704	153:48	:46	154:34	5:08
705	135:52	10:44	146:36	4:32
706	158:54	5:24	164:18	5:18
	898:31	38:08	936:39	5:00

LOCAL SERVICE AIRLINES
Comparison of U. S. Mail Ton-Miles Flown
1957 - 1958

Carrier	1957	1958	% Increase
Allegheny	100,690	139,042	38.1
Bonanza	51,151	64,515	26.1
Central	50,205	66,361	32.2
Frontier	214,637	230,449	7.4
Lake Central	32,900	43,291	31.6
Mohawk	72,362	92,657	28.0
North Central	255,460	302,144	18.3
Ozark	133,777	131,418	(1.8)
Pacific	113,555	135,624	19.4
Piedmont	161,235	170,815	5.9
Southern	115,057	111,436	(3.2)
Trans-Texas	166,460	176,654	6.1
West Coast	52,693	56,189	6.6
Totals	1,520,182	1,720,595	13.2

LOCAL SERVICE AIRLINES
Comparison of Revenue Miles Flown
1957 - 1958

Carrier	1957	1958	% Increase
Allegheny	6,400,107	6,342,728	(0.9)
Bonanza	3,165,254	4,046,641	27.8
Central	3,368,614	3,731,764	10.8
Frontier	5,583,686	6,181,162	10.7
Lake Central	2,781,004	3,064,414	10.2
Mohawk	5,311,389	5,039,772	(5.1)
North Central	9,494,901	11,262,997	18.6
Ozark	6,173,685	6,351,562	2.9
Pacific	4,551,716	5,384,049	18.3
Piedmont	7,424,438	7,807,166	5.2
Southern	3,901,046	4,076,250	4.5
Trans-Texas	6,271,605	6,162,520	(1.7)
West Coast	4,030,658	4,104,102	1.8
Totals	68,458,103	73,555,127	7.4

Local Service Commuter Traffic

MOST traffic carried by the local service airlines is interline (feeder), with local traffic in the minority and commuter passengers (going and returning the same day) a small part of the local traffic. Interesting developments and trends in commuter traffic are contained in the following roundup:

North Central Airlines

NORTH Central has developed its commuter traffic to the extent that it now accounts for over 45% of the airline's business. Its "mass production" flight schedules have made it a leader in the local service industry. On the 82-mile Milwaukee-Chicago segment, for example, North Central now flies 55 flights a day and carries 85% of the business in the face of direct competition from two trunks.

Mohawk Airlines

MOHAWK'S early experience with fare reductions for round trips completed within 24 hours have indicated that the excursion fare did not attract a substantial number of new passengers and that time and convenience are more important to the passenger than dollar savings. Scheduling policy now is to provide commuter service to every possible pair of cities on its system. A breakdown of the source of 1958 passenger revenues shows 86% were from 25 short-haul commuter markets, representing nearly $5.5 million. To compete with autos on superhighways, Mohawk efforts are aimed at increasing flight frequencies and making it easier for passengers to buy tickets and board its planes.

Ozark Airlines

WHILE there has been some change in the type of traffic handled by Ozark during its first 8.5 years of operation, the most recent figures are fairly consistent with previous experience. At the present time approximately 75% of our total business is involved in an interline movement, i.e., traffic which we turn over to or receive from another carrier. We make direct connections with twenty-three carriers.

Approximately 25% of our business could be classified as commuter or local type traffic. This solid 25% is extremely important to us, and we do all possible to encourage that type of business. It has been Ozark's feeling from the beginning, however, that we were primarily certificated as a local and feeder type carrier by the CAB to provide the interline or feeder type connection between the smaller intermediate type cities and the major traffic centers which we serve. During 1958, out of approximately $5,000,000 in passenger revenue, Ozark received $2,700,000 from the trunk carriers. Ozark produced $3,995,000 in business which was turned over to the trunks.

In our scheduling policy, one of the primary considerations is to develop a schedule pattern with a maximum number of connections to and from the other carriers. To this extent, our schedule is designed primarily with connecting traffic in mind, rather than a commuter type traffic.

It has also been our consistent experience that there are no two communities which are exactly alike in respect to commuter traffic. For example, Chicago, which is the largest city we serve, the largest trade center which we serve, and which has the busiest airport in the world, produces very little strictly commuter-type traffic. Practically 90% of our business handled to and from Chicago is interline. In the Quad City area (Moline, Davenport, Rock Island and East Moline), people do not seem to mind leaving on early flights in the morning, going out into the territory and returning to the Quad City in the evening. In some instances, such as Springfield, Missouri, a city of 80,000, which is 200 miles from St. Louis, we have specifically tried a commuter type schedule; however, it did not have too much appeal, as reflected in the results.

Different areas of the country will affect commuter traffic. For example, Ozark's route, which is in the "bread basket of America," has an excellent highway system and very level terrain. Most of our commuters jump in their "air-conditioned Oldsmobiles" and barrel down Highway 66 to Chicago, rather than to take the time to go out to the airport at Springfield, Illinois, twenty minutes ahead of flight time, spend an hour and a half flying to Chicago, wait twenty minutes for their baggage (we hope!), and then spend an hour going from Midway to the Loop in a limo.

We do attempt to develop as much commuter business as possible, particularly through our trade-agreement advertising on radio and TV and signs along the highways which, in substance, say "Next Time Fly."

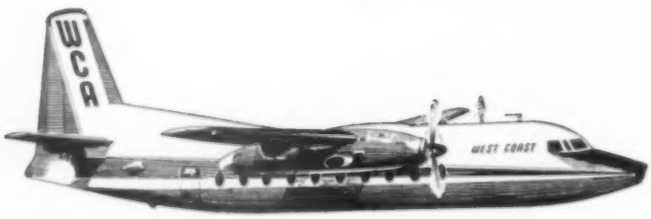
Since nationally about 90% of the intercity traffic is by automobile, the private car is probably the principal deterent to commuter type traffic on our system. We have found that in Ozark's operation, the "pendulum has swung" in respect to the professional traveler's viewpoint on safety in respect to the automobile. For example, with the excellent highway system we have in our area, it was our feeling that this would be a real handicap in securing business for our short-haul operation; however, an average of three people a day are killed on the highways in Illinois and an average of three people a day are killed in Missouri on the highways. Therefore, the professional traveller, even when he is going as a commuter, realizes that he is many times safer flying on a scheduled airliner, for example, between St. Louis and Kansas City, than he would be on Highway 40 with a "near miss" approximately every 120 seconds.

In summary, while commuter traffic is important to Ozark, and we do our best to develop it and keep it as a market where it fits into the picture, we are primarily a feeder type carrier to the extent that a major portion of our business is connecting business to and from the large terminals. The most important relationship we have is that with our interline customers.

Central Airlines

FOR the most recent period in which a check was made, 65% of the passengers traveling on Central are doing so as part of an interline journey in which at least one other airline is involved. This means

West Coast sets new passenger records with F-27!



Since the F-27 Prop-Jet was introduced September 28, 1958, during the first six months of operation:

- The average passenger load is up 48% on flights where F-27's replaced DC-3's.
- System-wide there is an increase in passengers per mile of 19.81%.
- Total passengers carried has risen 14.62%.
- The average distance per passenger increased from 180 miles to 194.
- The volume of interline exchange broke all records for any previous six-month period.

WEST COAST AIRLINES

Serving 42 cities in Washington, Oregon and Idaho; soon to serve 21 more in California, Utah and Montana.

that only the remaining 35% of Central's traffic is "local" in nature, traveling only between points on Central's system.

For the 30 day period April 16 to May 15 of 1959, Central has made an analysis of the tickets sold at four intermediate cities for which Central provides a perfect commuter service into important trade centers. The four markets analyzed were Lawton, Oklahoma, to Dallas and Fort Worth; Joplin, Missouri, to Kansas City; Duncan, Oklahoma to Dallas and Fort Worth; and, Ponca City, Oklahoma to Tulsa. These four pairings of cities are served exclusively by Central.

For the Lawton to Dallas and Fort Worth market Central provides a 7:25 a. m. departure from Lawton with an 8:40 a. m. arrival in Dallas; the return flight leaves Dallas at 7 p. m. and arrives Lawton at 8:17 p. m. This permits the commuter the use of a full business day in Dallas or Fort Worth. The highway distance between Lawton and Dallas is 212 miles and Central's airline distance (via Duncan) is 151 miles. In this market only 4% of the Lawton ticket sales to Dallas and Fort Worth were to passengers planning to complete the round trip all in one day. A total of 78% of the traffic was making interline connections to other airlines at Fort Worth or Dallas. It should be noted that the location of Fort Sill, Oklahoma, adjacent to Lawton, has a very dominating influence on the over-all traffic between these cities with much of the military traffic traveling to such points as Washington, New York, Los Angeles, Atlanta, etc. via the Dallas-Fort Worth gateway.

Of the tickets sold at Joplin destined to Kansas City, 17% were to passengers who planned to complete a round trip within the day. This is the greatest commuter market on Central's system. The service Central provides in this market is an 8 a. m. departure from Joplin arriving Kansas City at 8:57 a. m. with a return flight departing Kansas City at either 5 p. m. or 7:50 p. m., arriving at Joplin at 5:59 p. m. or 8:49 p. m. This service allows the air traveling commuter a full business day in Kansas City. The highway distance between the two cities is 161 miles and the airline distance without intermediate stops is 136 miles. A total of 55% of the tickets sold in Joplin destined to Kansas City on Central consists of local traffic moving only between Joplin and Kansas City.

Duncan is served by Central as an intermediate point between Lawton and Dallas/Fort Worth and, as a re-

(Continued on page 86)

THE NAPIER JET-PROP CANADAIR-CONVAIR 540

Napier 3500 hp. jet-prop engines will convert your Convair 340/440 into a jet-prop Canadair-Convair 540 . . . or you can buy a brand-new Napier-powered Canadair-Convair 540.

- Terminal to terminal operation on routes up to 650 miles—multiple stops—without refueling—with full passenger load and normal reserves
- 326 mph. guaranteed cruising speed at 20,000 feet
- Comfortable seating capacity optional to your requirements—up to 58 seats
- Increased passenger appeal—because noise and vibration are minimized
- 56% reduction in climbing time to cruise altitude
- 20 years of profitable service life ahead

A world-wide demonstration flight tour is now underway. Arrange for your see-for-yourself flight by writing to Napier Engines, Inc., 909 Dupont Circle Building, Washington 6, D. C.

*58 seat configuration . . . 500 mile stage

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A SUBSIDIARY OF D. NAPIER & SON, LTD., LONDON, ENGLAND • A MEMBER OF THE ENGLISH ELECTRIC GROUP OF COMPANIES

Nine passengers per flight is maximum load for TAG Airlines' de Havilland Doves, which are averaging 2,000 passengers monthly between downtown airports at Chicago, Detroit and Cleveland. Passengers are pictured in ticket office and boarding one of the Doves.

A Third Level For Air Commerce

AN unsubsidized air commuter line offering frequent shuttle service between Chicago-Detroit-Cleveland is making short-haul aviation history to the tune of 2,000 revenue passengers every month. TAG Airlines, Inc., using convenient close-in airports at the three cities, served 23,325 passengers in 1958 and so far this year is registering traffic increases each month.

The company, originally organized in 1955 as Taxi Air Group, to fly seaplanes for summer tourists between Detroit and Cleveland, has under new management become a year-around operator, a lusty product of old-fashioned American rugged individualism and private enterprise.

It has never taken a dollar of government subsidy and says it never wants any. Its management reports that it is operating virtually in the black, and it asks only an opportunity to stay in business to show the skeptics what valuable public service possibilities the future can offer with a national unsubsidized network of fast, efficient air commuter services. These would supplement but not compete with the trunklines, local service carriers, and suburban helicopters, the company says. They would create many thousands of new customers who otherwise might not take to the air.

TAG is operating with twin-engine de Havilland Dove aircraft that do not permit it to benefit even up to the full 12,500-pound gross weight limitation placed by the Federal Aviation Agency on operations certificates in the air taxi category. The Dove grosses only 8,800 lbs. Nine passengers per flight is TAG's maximum payload, plus two pilots, baggage, and a little cargo. TAG's planes are not much faster than a DC-3. Only token advertising has been possible. Trunklines are offering more flights per day than TAG between TAG's cities. TAG's fares are higher than those of the trunk and local service competition. Yet TAG business increases, and a fourth Dove had to be added to the fleet in May.

Downtown Airports Used

What is the secret? The secret is that TAG saves its commuter customers — most of whom are businessmen — that priceless thing called time. Time saved is mostly ground travel time between downtown and outlying airports.

At Chicago, TAG's planes use Meigs Airport on the lakefront, five minutes or so from the downtown Loop district, and outside the congested air traffic zones of the city's two giant airports to the west. At Cleveland, TAG again is the only airline to use Lakefront Airport, only about five minutes' taxi ride to downtown. At Detroit, TAG operates from City Airport, where it also has modest offices, and maintenance space. City Airport is adjacent to the industrial district and only about 20 minutes from downtown Detroit.

Even with its Doves, TAG airport-to-airport schedules compare well with considerably faster flying airliners of the trunk carriers. For example, TAG flies straight across Lake Erie from Detroit to Cleveland in 38 to 45 minutes. None of the major carriers schedules the hop from Willow Run or Metropolitan in less than 36 minutes, and some require 50 or more. Then the trunk passenger has a limousine ride of an hour or more at each end of the flight.

TAG uses smaller airports, mainly patronized by private aircraft, and its flights are subject to few take-off or landing delays caused by heavy traffic. TAG's management demands on-time operations, and the lack of red tape and confusion before a departure, prompt and efficient handling of baggage, and a quick getaway, constantly impress the ever-increasing number of business executives who are using the line. There is never a baggage delay at destination. Taxis are always waiting for each plane arrival.

The company is not a member of the Air Travel Plan but it accepts all major national credit cards as a basis for credit. This has been a popular innovation for every businessman today carries at least one credit card of national scope, and he probably wants not only to conserve his cash but to have a written record of his ticket purchase for expense account and tax purposes.

TAG also pays higher commissions to air travel agents than most of the nation's air carriers. This means the line has many boosters in sales, in addition to old patrons.

All TAG flights carry instrument pilots on the nine-passenger planes. TAG does not carry U. S. mail but its courier package business is growing. In March its non-baggage cargoes were 8,673 pounds.

Frequent Schedules

TAG currently offers eight round trips each business day between Detroit City and Cleveland Lakefront, and two round trips between Chicago and Detroit. The latter segment was opened late in 1957. Since almost all patrons are businessmen, the company operates only charter flights on Saturdays, Sundays and holidays. Summer prospects appear likely to justify extra sections, or an increase in regular schedules. Both Capital and American dropped a number of Chicago-Detroit flights April 27 and this has increased

demand for TAG service over Lake Michigan.

While the company will sell through tickets between Chicago and Cleveland, via Detroit, it does not promote this business, in the belief that the maximum value of TAG to the public is in the single hop, with non-stop service.

The company employs about 25 persons. It believes it is the only unsubsidized commuter air service in the country serving more than two metropolitan centers. Only the threat of parallel competition which may be permitted by the government on the part of subsidized local service carriers is holding up expansion plans to other cities which have been losing air schedules in the past year.

The commuter carrier came to new life when it was reorganized as TAG Airlines, Inc., and began service under the management of Ross E. Miller in the summer of 1957. Doves replaced a deHavilland Beaver and an Otter, both seaplanes. From July 1 through December 31, TAG carried 3,917 passengers.

Traffic Analysis

In 1958, the first time the service went on a year-around basis, the 23,325 passengers represented 15,660 on the Detroit-Cleveland segment, 6,741 on Chicago-Detroit, and 924 on a Cleveland-Akron run which was discontinued temporarily on Oct. 1 in order to meet heavier demands on the Detroit-Cleveland hop. In 1957 TAG had assumed from Illini Airlines a Chicago-Rockford run, which was discontinued before the end of the year. A four-engined deHavilland Heron, also taken over from Illini, was operated by TAG five months during the year, with the three Doves.

So far this year, TAG has carried 1,736 passengers in January, including 479 on the Detroit-Chicago segment; 1,518 passengers in February, with 311 of these on the Chicago run; 2,008 passengers in March, including 434 on the western route; 2,208 in April, including 427 in and out of Chicago, and 2,350 in May.

In addition to President Miller, the Detroit headquarters is directed by Robert E. Browne, general manager, formerly Eastern Region Operations Manager for Slick Airways, and holder of an airline transport pilot rating.

Ross Miller is one of the leading proponents of scheduled air taxi or commuter services in the country. As owner of TAG, he believes he is conducting a significant test that bears all the earmarks of success if permitted to continue. Miller also heads Miller Oil Co., of Toledo, O., of which TAG Airlines, Inc., is a subsidiary. Miller has been a pilot some 20 years, flies his own executive plane, and has always been deeply interested in aviation.

Time Saved By Using Downtown Airports

Table below, appearing in TAG Airlines' advertisement in the Official Airline Guide, shows how the enterprising commuter line saves ground travel time for businessmen patrons who use its schedules. Service operates five days a week.

Between	TAG Airlines	Other Typical Airlines Inc. Limo from Downtown to Airport	Average Time Saved One Way	Average Time Saved Ro. Trip
Downtown Cleveland and Detroit	45 mins.	2 hrs. 53 mins.	2 hrs. 8 mins.	4 hrs. 16 mins.
Detroit and Downtown Chicago	90 mins.	3 hrs. 27 mins.	1 hr. 57 mins.	3 hrs. 57 mins.

TAG's president feels aviation should serve the public on its own initiative, with its own funds wherever possible, without subsidy. Whenever a carrier shows significantly — as he feels it does in TAG's success — that it can meet the public convenience and necessity without subsidy, then it shouldn't either ask or get any. And where such success is evident, government has no right to lay down subsidized competition alongside it and snuff it out.

Miller is frankly worried because two local service carriers (Allegheny and North Central) applied for the Detroit-Cleveland route, including close-in airports, which he has pioneered without taking a dollar of Uncle Sam's money. An examiner's report has not yet been issued in the Great Lakes Local Service Case and CAB spokesmen say it is not imminent.

The TAG achievement is beginning to be watched closely for its possible significance in the rapidly changing route and service pattern of U. S. air transportation, spurred by introduction of the new jet and turbo-prop airliners.

Miller is convinced that the TAG concept of very frequent non-stop service between close-in metropolitan airports meets many short-haul requirements that have been called for in recent months by government aviation authorities for the future and, with a few variations, Miller believes the TAG formula could meet all of these requirements.

For example, these officials have emphasized that the industry — and the Federal government — must not let the big jets distract them from the need to continue opening new service to new communities, to add new through service between small and intermediate cities, to strengthen small and medium carriers, and to eliminate subsidies.

Especially in the past year the CAB and its spokesmen have espoused the cause of greater development of local and short-haul services, and have certificated many new cities and route segments on a local-service basis.

In what is becoming recognized as a classic statement on the subject of route development in the next ten years, John W. Dregge, chief of the Routes Division of the Bureau of Air Operations for CAB, noted last February that "we have three layers in our air transportation system — all at different stages of maturity. These are the trunkline system, the local service system, and the third layer — now served in a limited manner by helicopters in suburban services. . . . As the local service carriers expand their efforts into more of the smaller trunkline markets and concentrate their efforts on this type of operation, I believe the third layer . . . will be expanded in the next 10 years when more efficient and economical craft become available for the taxi and commuter type of service in the markets immediately surrounding our major traffic generation."

Small Jetliners Proposed

The key to success in developing this new third layer of air transportation, the air taxi or commuter service, is the small, high speed jet transport carrying 10 or 12 passengers at first, and more later, Miller believes. The government should make certain readjustments in the 12,500 pound gross weight limitation, placed on the air taxi business when the DC-3 was the largest transport flying. He believes the changing route and traffic pattern of the country will bring requirements not only for high frequency flights between cities with close-in airports 200 miles apart as in the TAG system, but for longer non-stop runs between intermediate cities and between intermediate and the largest cities, where trunkline frequency is inadequate. There will also be increasing need for third layer carriers to serve airports of the size some local service lines are already abandoning or seeking to abandon.

Small jet planes of the 10-12 passenger category could make landings at small airports only when waiting passengers were to be picked up or others landed, as in the flag-stop days of the railroads. This type of operation

TAG Service Is Worth Higher Fares

Table below shows how TAG's higher fares compare with those of trunk and local service carriers. Ever-increasing patronage of TAG, mainly from businessmen, indicates they feel time and money not spent on long limousine or taxi trips to or from outlying airports are worth a premium on the fare (figures do not include 10% tax).

	Standard 1st Class	TAG Fares
Chicago-Detroit	$17.90	$22.90
Detroit-Cleveland	8.80	14.00
Chicago-Cleveland	21.80	29.90

would open up air service to scores of communities offering marginal or insufficient prospects to the local service airlines, and would relieve them of responsibility for providing uneconomical service. Only in recent weeks, Allegheny Airlines has discontinued service at Easton and Cumberland, Md., Lock Haven, Pa., and Dover, Del., for example, because they have failed to provide the required five passengers per day. Perhaps a choice of eight flights a day, on a flag stop arrangement, might attract more business than a local service carrier could build on two flights a day, Miller believes.

Miller contends that cities up to 500,000 population still do not realize the predicament they are slowly but surely being pushed into. "They really have no chance for greatly improved air service unless they adopt the commuter non-stop airline idea," he believes. Cities like Miller's native Toledo are finding themselves on fewer and fewer through trunkline schedules, yet the regional and multi-stop patterns of the local service carriers make it impossible for these operators to fill the vacancies.

Sabreliner Believed Suitable

The best example of a small jet cited by Miller for possible air commuter work is the North American Sabreliner, twin-jet, 10-passenger, 500-mph. utility transport that can take off in 2,500-3,500 feet at gross weight of 16,300 pounds. It can land in 2,000 feet. It can climb 5,500 feet per minute fully loaded. Its ceiling is 40,000 feet, with pressurized cabin. Miller says it can operate at a third of the cost of a DC-3, and it is safer over a congested area because of better single engine performance. It will be available in two years or less. Miller has computed operating cost of the commercial Sabreliner at $125 an hour, or 2.5 per seat mile.

Such a commuter plane could fly from Detroit City Airport to Chicago's Meigs (Lake Front) Airport, about 250 miles, in about 40 minutes, or between Cleveland Lakefront and Chicago Meigs, 325 miles, in about 50 minutes. Although carrying fewer passengers per trip, it could accommodate more persons over a given distance after the first hour or so of flight, than a DC-3, and the advantage would continue to increase each additional hour, not to mention the increased flight frequencies, time saving and added comfort to the passengers.

These points are made by TAG's president:

Change the FAA-CAB 12,500-pound gross weight limits, allow the small turbo-props and jets to serve as they are designed to serve.

Set up a new classification or certificate which would encourage private capital to start these services without subsidy and receive protection from the trunk and local service lines when they are successful.

Cities like Cleveland, Chicago, Detroit, Cincinnati, Akron and Pittsburgh, all with close-in airports, could have and should encourage direct non-stop air service, each to the others, such as TAG now provides. They could also have direct non-stop service to New York and Florida points such as Fort Lauderdale, Sarasota, Fort Myers and Orlando. This would eliminate the Florida terminal points of Miami, Jacksonville and Tampa for passengers who don't want to go there. The trunklines could not possibly provide this service. Why should the passenger be penalized with so much time to and from terminal airports?

COPTERS FOR LOCAL SERVICE will become practical with multi-engine transport helicopters of the type J. E. Beighle (left), sales manager for Sikorsky Aircraft, is showing in the picture above to Thomas J. Kirkup, Mohawk Airlines vice president. They're in mockup of new 25-place Sikorsky S-61.

Most cities up to 500,000 population, unless they are terminal points, will be relegated to feeder service with smaller aircraft, which means change of planes for long haul trips.

The small jet could give more convenient leaving times and more frequent schedules. The trunks would not be interested in providing this service in the smaller cities and the local carriers could not, as they are certificated for local and feeder service only. This would be a new and specialized type of airline, providing service that will be needed more as time passes, and cannot be given by any other type of carrier.

The small jet could give any city airline service that could provide eight to 10 passengers per day to any other given city, and without subsidy.

Small jet service would encourage more of the public who now drive, to fly because of the saving of ground travel time and waiting for or changing planes.

Local service airlines usually give direct non-stop service to the nearest large cities. All other flights must go to terminal points or stop en route.

Small jetliners can provide service direct to Florida points, New York, Chicago, Houston, etc., from towns that cannot afford the runways or provide the passengers needed to justify landings by the trunklines and their larger planes. A Sabreliner can profitably and without subsidy haul eight or 10 passengers from a city where it would not be economical to land a 60-place transport for the same 10 passengers. The Sabreliner would also deliver them to their destination non-stop, faster than any commercial airliner that could operate off other than the longest runways.

Small jet airliners would eliminate the need for most cities to spend large sums lengthening runways for planes that cannot profitably serve them.

The small jet airliner would build a reservoir of high speed, utility transports, with qualified pilots, which would be available in a national emergency.

Ross Miller believes the prospect of developing the "third layer" of air transportation, typified by TAG Airlines, for example, represents a golden opportunity for the government to carry out the avowed charge of Congress to encourage and promote an air transportation system that meets the present and future needs of commerce, the postal service and of national defense.

Local Service Airline Directory

L. O. Barnes

Allegheny Airlines, Inc.
Washington National Airport, Hangar No. 12, Washington, D. C.

First scheduled passenger service started March 7, 1949. Now serving over 50 cities, 2,202 system route miles, 832 employes, operating 11 Martins, 12 DC-3's, 1 Canadair-Convair 540 (effective July 1).
President: Leslie O. Barnes.
Senior Vice President: David L. Miller.
VP-Finance: Walter J. Short.
VP-Flt. & Psgr. Svc.: R. G. Dinning.
VP-Maint. & Engrng.: R. J. Masiello.
Treasurer: George F. Gerth.
Controller: W. Dale Hay.
Asst. to Pres. & Scty.: E. I. Colodny.
Dir. Flt. Ops.: Capt. Harvey Thompson.
Dir. Maint.: Leroy L. Johnson.
Dir. Supply: R. C. Gudikunst.
Dir. Sales: Jack K. Svitzer.
Dir. Stations: R. C. Schumm.
Dir. Reservs.: L. T. Ferguson.
Dir. Pub. Rels.: Peter D. Brennan.
Asst. to VP-Finance: W. L. Wickham.
Chief Dispatcher: Karl Tewell.
Mgr. Sched & Tariffs: George N. Spooner, Jr.
Mgr. Production Control: James Keenan.
Office Mgr.: R. A. Hayes.
Cust. Rels. Rep.: R. M. Clark.
Pur. Agent: G. J. Lostetter.
Reg. Sales Mgrs.: E. F. Bracken, Pittsburgh; W. J. Meyers, New York City.
Dist. Sales Mgrs.: J. R. Luke, Philadelphia; J. E. Manger, Harrisburg; E. P. Van Maele, Cleveland/Detroit; Jack H. Hiller, Washington.
Corp. Counsel: Hale, Stimson, Russell, & Nickerson.
Research Consultant: Gotch & Crawford.

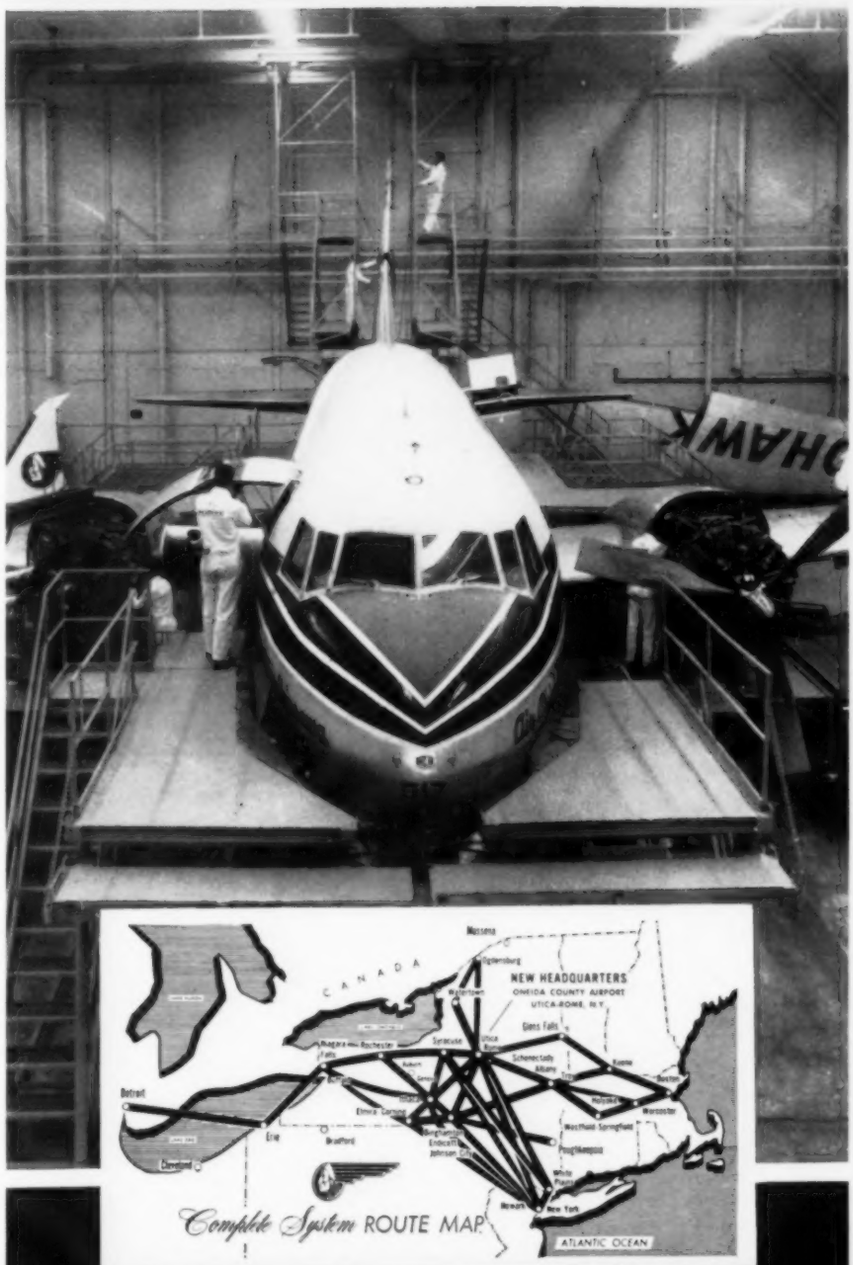
Ed Converse

Bonanza Air Lines, Inc.
Post Office Box 391
McCarren Field
Las Vegas, Nevada

First scheduled service started Aug. 6, 1946. Now serving 26 cities, 2,690 system route miles, 10 Douglas DC-3's, 3 Fairchild F-27A's (3 additional F-27A's on order; 6 more on option), 460 employes.
President and Chairman: Edmund Converse.
Executive VP: G. Robert Henry.
VP-Operations: Myron W. Reynolds.
VP-Traffic & Sales: William J. Mitchell.
Treasurer: Robert J. Sherer.
General Counsel: Ralston O. Hawkins.
Comptroller: Earl Jochim.
Dir. Ind. Rels.: Richard Rogers.
Asst. to Pres.: Jack Arant.
Asst. to Executive VP: Donald Neilson.
Asst. to VP-Ops.: Louis J. Arpin.
Gen. Sales Mgr.: Larry Decker.
Gen. Traffic Mgr.: Charles D. Driskill.
Supt. Pur. & Stores: Earl E. Hall.
Supt. Stations: Bernard Novia.
Chf. Pilot: Paul A. Beach.
Chf. Hostess: Joanne Cheek.
Supt. Maint.: George Davis.
Supt. Inspection: Jack O'Dell.
Supt. Comms./Electronics: John S. Glenn.
Sup. Res. & Space Control: Elizabeth Ellingham.
Dir. Printing & Publications: David Beattie.
Supt. Flight Dispatch: Ralph Keele.
Dir. Maint. Training: Ernest Winn.
Chief Accountant: M. D. Donnelson.
Sup. Revenue Accounting: C. W. Hartley.
Pass Clerk: Gladys Pyles.
Regional Sales Mgrs.: R. J. Murray, Calif.; Bruce Ryan, Ariz.; R. T. Czerny, Utah.
Dist. Sales Mgr.: Phil Mench, Reno, Nev.; Robert Busseau, Ontario, Calif.; L. Lee Fuson, Flagstaff, Ariz.
Wash. Counsel: W. C. Burt and Al Grisard.

MOHAWK IS NOW OPERATING FROM ITS NEW $3 MILLION HEADQUARTERS PLANT

The first structure designed specifically for the future needs of a short-haul airline, the MOHAWK Headquarters provides increased efficiency and reduced maintenance costs and time — thus providing additional seats daily for the traveling public. This new facility is truly a model for the airline industry!



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AIRLINES
The Route of the Air Chiefs
EXECUTIVE OFFICES: UTICA, NEW YORK

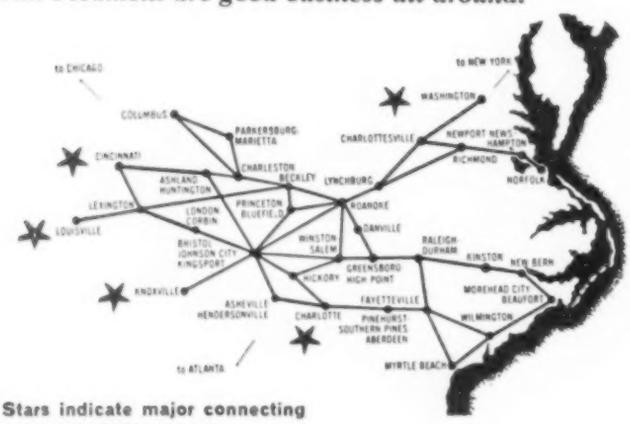
CONNECT TO PROP-JETS

along Piedmont Airlines' route of the pacemakers

Piedmont Airlines has now placed eight F-27 prop-jets in service on its seven-state system. These modern airliners, especially designed for faster, more convenient regional flight service, have been enthusiastically approved by thousands of passengers. And thousands more will enjoy the luxury and comfort of F-27 Pacemakers in the months ahead.

In 1958 Piedmont continued to show significant growth in traffic and attained the highest load factor in the local service industry—52.3. Now with 20 F-27 prop-jet flights daily—and more planned—Piedmont is generating an increasing volume of air travel.

Now more than ever before, interline connections with Piedmont are good business all around.



★ Stars indicate major connecting points for F-27 service

PIEDMONT Airlines

Home Office & Operations Base, Smith Reynolds Airport
WINSTON-SALEM, NORTH CAROLINA

Keith Kahle

Central Airlines, Inc.
Meacham Field,
Fort Worth, Texas

First scheduled service started Sept. 15, 1949. Now serving 36 cities, 3,606 system route miles, 15 Douglas DC-3's, 476 employes.
Chairman: F. Kirk Johnson.
President: Keith Kahle.
Ex. VP-Treas.: F. E. Howe.
VP-Traffic & Sales: A. S. Aldridge.
VP-Ops.: R. L. Wageneck.
Secty. & Asst. Treas.: C. E. Lundstrom.
Traffic Mgr.: J. C. Dixson.
Mgr. Mil. Transp.: R. G. Wagley.
Mgr. Psgr. Svc.: J. W. Force, Jr.
Asst. Mgr. Psgr. Svc.: J. F. O'Drain.
Dist. Sales Mgrs.: H. F. Harbuck, Dallas-Ft. Worth; Paul H. Jones, Kansas City; V. R. Westbrook, Oklahoma City; J. D. Sullivan, St. Louis; T. A. Kautz, Wichita; Wm. Jackson, Denver; J. F. Ricketts, Lubbock.
Supv. Rates & Tariffs: F. S. K. Masi.
Sales Prom. Mgr.: G. L. Wysatta.
Internal Auditor: H. E. Dalrymple.
Chief Acct.: R. J. Clauser.
Pur. Agent: A. C. Terrill.
Mgr. Stores: H. W. Nelson.
Dir. Personnel: J. K. Mikel.
Sup. Print Shop: T. M. Lane.
Supt. Stations: T. W. Jones.
Asst. Supt. Stations: John R. Jones.
Dir. Flt. Ops.: W. A. Whitlock.
Chf. Flt. Supt.: R. R. Conner.
Chf. Stewardess: Thelma Doyle.
Dir. Maint.: D. S. Vaughn.
Supt. Maint.: F. N. Walsh.
Chf. Inspector: W. E. Beck.
Supt. Comms.: R. E. Wilson.
Sup. Reservations: Francene Morris.
Corp. Counsel: Hudson, Keltner & Sarsgard.
Wash. Counsel: Pogue & Neal.
Research Consultant: E. H. Pickering.

L. B. Maytag, Jr.

Frontier Airlines, Inc.
Hangar No. 5
Stapleton Airfield
Denver 7, Colorado

First scheduled service started Nov. 27, 1946. Now serving 67 cities, 6,504 system route miles, 25 Douglas DC-3's, 5 Convair 340's, 1,086 employes.
Chairman & Pres.: Lewis B. Maytag, Jr.
Executive Vice President: G. Ray Woody.
Secretary: John A. Love.
VP-Finance & Controls: L. P. Blatter.
VP-Traffic & Sales: To be announced in June, 1959.
VP-Operations: H. P. Barnard, Jr.
Dir. Accounting: D. W. Rausch.
Dir. Economic Controls: John Clark Coe.
Mgr. Costs Controls: Marv Larson.
Dir. Procurement: B. E. Foster.
Dir. Industrial Relations: A. J. Schmidt.
Mgr. Revenue Accounting: J. L. Chapel.
Mgr. Payroll & Statistical Acctng.: R. B. Snider.
Mgr. Gen. Acctng.: E. L. Lamansky.
Mgr. Machine Acctng.: C. H. Turner.
Mgr. Stock & Stores: W. D. Hamilton.
Mgr. Personnel: G. C. Shaffer.
Mgr. Publicity: E. H. Gerhardt.
Mgr. Training & Safety: L. L. Love.
Coordinator Traffic & Sales: Vern Carlson.
Dir. Traffic: J. B. Montgomery.
Dir. Sales: T. M. Makurat.
Mgr. Stations: E. L. Snoke.
Mgr. Flight Service: W. R. Monday.
Sup. Station Training: G. B. Fox.
Sup. Res. & Payload: G. L. Lewis.
Sup. Psgr. Equipment & Supplies: L. L. Peterson.
Chief Stewardess: G. Anderson.
Mgr. Sales Promotion: G. W. Dahl.
Mgr. Scheduling & Adv.: C. R. Lubben.
Sup. Tariffs: C. M. Almquist.
Dir. Maintenance: K. W. Stevenson.
Dir. Flt. Ops. & Chf. Pilot: E. L. Aden.
Dir. Engineering: E. W. Lott.
Supt. Flt. Ops.: G. H. Nettleblad.
Chf. Dispatcher: V. R. Stever.
Supt. Maint.: Ken Cook.
Supt. Ground Facilities: F. L. Davidson.
Supt. Comms.: C. C. Longhart.
Supt. Engineering: Roland Roepe.

Supt. Inspection: E. W. Fisher.
Supt. Maint. Training: Al Olinger.
District Sales Mgrs.: Earl Passwater; Don Boyle; Tom Morris; Mel Brandt; George Naglich.
Sales Reps.: Andy Stephenson, Barry Klingsmith, Ev Mill.
Reg. Sups. of Stations: V. L. Alvey, H. E. Davis, L. Berets, C. Foster, R. Gildea.

Gwin Hicks

Lake Central Airlines, Inc.
Weir Cook
Municipal Airport
Indianapolis
21, Ind.

First scheduled service started Nov. 7, 1949. Now serving 31 cities, 2,285 system route miles, 12 Douglas DC-3's, 345 employes.
Chairman: J. J. O'Connell, Jr.
President: Gwin Hicks.
Exec. VP: Lloyd W. Hartman.
VP-Traffic & Sales: D. S. Getchell.
VP-Ops.: Robert W. Clifford.
Asst. Treasurer: J. L. Cory.
Mgr. Tariffs, Sched.: Wm. R. Roth.
Dir. Public Rels.: James Humphrey.
Accounting Sup., Gen.: Ada Royer.
Acctng. Sup., Rev.: J. P. Berfanger.
Chf. Storekeeper: Robert Campbell.
Pur. Agent: C. L. Desterbecque.
Dir. Ec. Research: M. M. ErSelcuk.
Chief Pilot: A. E. Sabo.
Chief Dispatcher: A. E. Woolley.
Supt. Maint.: H. A. Petty.
Psgr. Svc. Mgr.: Robert Fisher.
Supt. Comms.: Charles Hildebrand.
Sup. Reservations: Juergen Ballast.
Wash. Counsel: Albert Grisard.

R. E. Peach

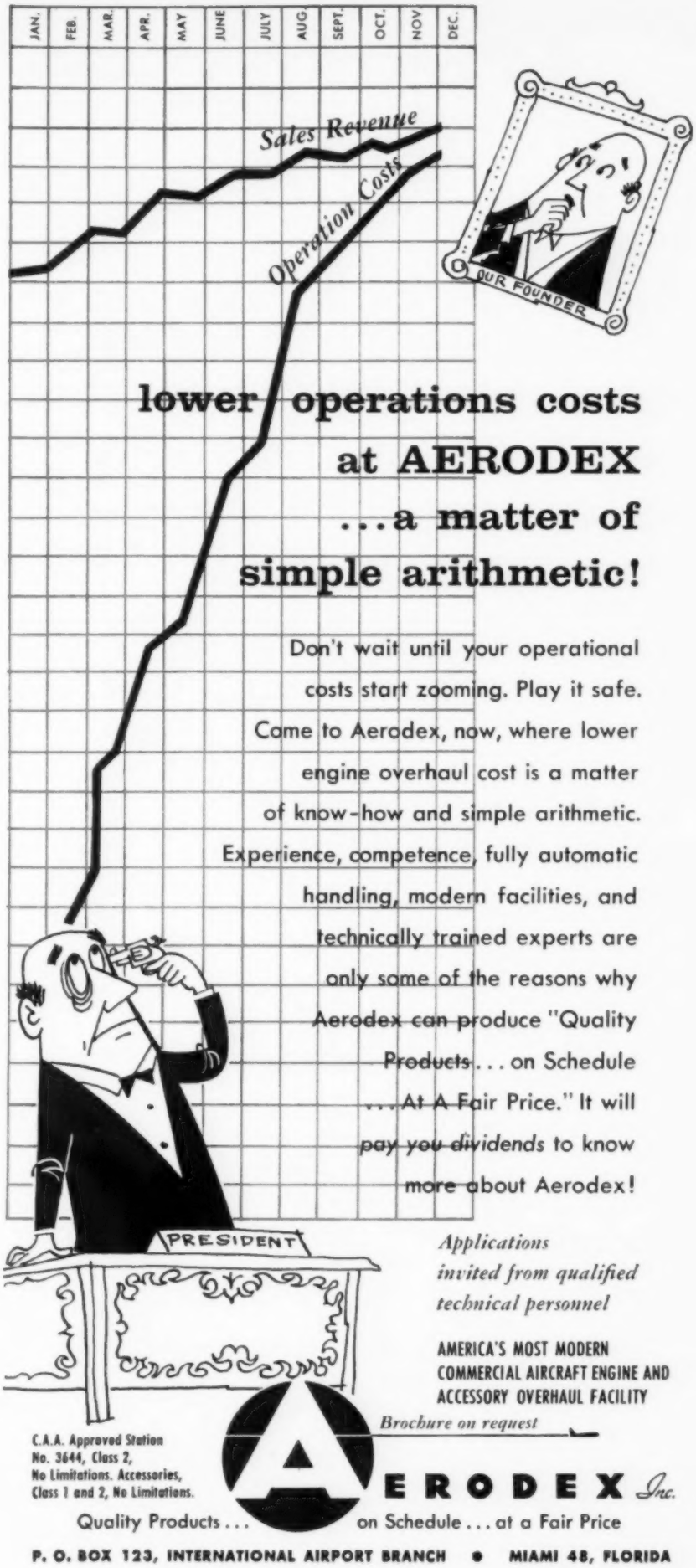
Mohawk Airlines
Oneida County
Airport
Utica, New York

First scheduled service started April 6, 1945. Now serving 34 cities, 1,686 system route miles, 8 Douglas DC-3's and 11 Convair 240's, 750 employes.
Chairman: E. Victor Underwood.
President: Robert E. Peach.
Exec. Asst. to Pres.: Helen R. Thomas.
VP-Gen. Counsel: John R. Carver.
VP-Ops.: Carl A. Benscoter.
VP-Sales: Thomas J. Kirkup.
VP-Personnel: R. V. Stephenson.
Secretary: Bruce C. McLean.
Treasurer: Frank R. Chabot.
Comptroller: R. J. Longwell.
Gen. Sales Mgr.: Howard W. Ostrom.
Dist. Sales Mgrs.: Western, Maurice M. Evans; Southern Tier, George L. Bright; Metropolitan area, E. D. Evans.
Dir. Reservations: Wayne F. Hersh.
Dir. Publicity: Ronald A. Krauss.
Dir. Pub. Affairs: R. T. Sidney.
Dir. Ground Ops.: Raymond A. Murray.
Dir. Statistics: R. P. Sherwood.
Dir. Psgr. Scheds. & Tariffs: DeHart B. Clute.
Asst. VP-Maint. Eng.: Remington R. Taylor.
Supt. Comms.: Emil R. Klusacek.
Dir. Purchasing: Glenn W. Irish.

H. N. Carr

North Central Airlines, Inc.
6201 34th Avenue
South, Minneapolis
50, Minnesota

First scheduled service started Feb. 24, 1948. Now serving 65 cities, 4,976 system route miles, 5 Convair 340's, 32 Douglas DC-3's, 1,606 employes.
Chairman: Arthur E. A. Mueller.
President: Hal N. Carr.
VP-Traffic & Sales: F. N. Buttomer.
VP-Ops.: A. D. Niemeyer.
VP-Ind. Rels.: A. E. Schwandt.
VP-Maint. & Engrng.: R. H. Bendio.
Vice President: A. L. Wheeler.
VP & Scty.-Treas.: Bernard Sweet.
Asst. Scty.: J. P. Dow.
Traff. Adm. Mgr.: Robert Erdmann.



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Pagr. Svc. Mgr.: John Minerich.
Fleet Service Mgr.: Brad Teasdale.
Tariffs & Scheds. Mgr.: C. B. Vesper.
Dist. Sales Reps.: John Hammer, Don LaMont, Jim Palm, Eugene Leonard, Robert Shook, Erling Nassett, Richard E. Peterson, Wayne Harris, Walter Janda, William Domres, John Harty; **Military Sales Rep.:** Dennis Weber; **Interline and Agency Rep.:** Henry Thiele.
Reg. Spts. Stns.: Robert Baker, Robert Smith, Richard G. Cooper.
Pub. Rels. Mgr.: Donald C. Wright.
Machine Acct. Sup.: W. E. Wolf.
Acctng. Sup., Gen.: Dan May.
Purchasing Agent: Gordon Bullis.
Supt. Stations: T. M. Needham.
Chf. Flt. Supt.: Joseph Sims.
Chf. Stewardess: Kathy Leddick.
Chf. Pilot: G. F. Wallis.
Chief Engineer: Ralph Roberts.
Supt. Maint.: Robert L. Gren.
Overhaul Supt.: G. Roycraft.
Electronics Supt.: A. Warner.
Sup. Reservations: Marvin J. Freund.
Wash. Counsel: A. L. Wheeler.

J. H. FitzGerald

Ozark Air Lines, Inc.
Lambert Field
St. Louis 21, Mo.

First scheduled service started Sept. 26, 1950. Now serving 52 cities, 5,273 route miles, 24 Douglas DC-3's, 3 Fairchild F-27's on order, 1,000 employes.
Acting Chairman, VP & Treas.: Floyd W. Jones.
Exec. VP & Gen. Mgr.: Joseph H. FitzGerald.
Secretary: Arthur G. Heyne.
Dir. Pub. & Intrln. Rels.: Paul J. Rodgers.
Dir. Adv. & Pub.: Francis M. Higgins.
Adv. Mgr.: Earl E. Bowman, Jr.
Ops. Mgr.: Julian A. Wiggins.

Pagr. Svc. Mgr.: Tom Keyes.
Gen. Traffic Mgr.: C. L. Tabor.
Traffic Mgr.: Henry L. Sweezy; **Asst.:** D. G. Weishaar.
Gen. Sales Mgr.: S. F. McCullough.
Reg. Mgrs.: Dean Holscher, Northeast; Richard Hannon, Central; E. A. (Joe) May, Northwest; Charles Johnson, Southwest; Vince R. O'Brien, Southeast.
Supt. Maint.: Ellwyn E. Boock.
Supt. Comms.: Phillip L. Newell.
Supt. Stations: C. C. Mounts.
Chf. Flt. Supt.: Wm. E. Enochs.
Comptroller: Edward J. Crane.
Chf. Accountant: Charles Owen.
Dir. of Purchases & Property: Rex E. Creighton.
System Res. Mgr.: Mrs. Connie Mounts.
Legal Counsel: James Verner and James Batchelor.

J. H. Connelly

Pacific Air Lines, Inc.
San Francisco International Airport
San Francisco, Calif.

First scheduled service started Dec., 1946. Now serving 33 cities, 1,896 system route miles, 11 Douglas DC-3's and 7 Martin 202's, 6 F-27A's, 560 employes.
Chairman: Leland Hayward.
President: John H. Connelly.
Exec. VP: T. R. Mitchell.
VP-Tfc.: R. E. Costello.
VP-Sales: M. A. King.
Treas.: E. R. Dahl.
VP-Finance: C. A. Myhre.
Pur. Agent: A. W. Slater.
Gen. Sales Mgr.: J. Carl Ferrell.
Dir. Flt. Ops.: R. Couk.
Flt. Supt.: Wm. G. Hall.
Chf. Stewardess: Mrs. Mary Jane Fischer.
Dir. Maintenance: D. Davison.
Supt. Maintenance: Arnold Boller.
Dir. Coms.: Odis Burris.
Wash. Counsel: T. I. Seamon.

Tom Davis

Piedmont Airlines
Smith Reynolds Airport,
Winston-Salem 1, N. C.

First scheduled service started Feb. 20, 1948. Now serving 30 cities, 2,019 system route miles, 21 DC-3's, 8 F-27's, 1,019 employes.
Pres. & Treas.: T. H. Davis.
Vice Presidents: C. G. Brown, Jr., H. K. Saunders, R. S. Northington (fixed-base division).
Scty., Asst. Trsr.: M. F. Fare.
Controller: T. W. Morton.
Gen. Sales Mgr., W. G. McGee.
Gen. Traffic Mgr.: R. E .Turbiville.
Dir. Scheds., Trfs., F. P. Lincoln.
Dir. Sales Prom.: H. R. Slater.
Dist. Sales Mgrs.: J. L. Wathen, D. G. Edmondson, R. J. Miller, G. W. Bennett, H. L. Warner, J. A. Humphreys, S. C. Folger, P. D. Loar.
City Sales Mgr.: O. E. Halsey.
Sales Rep., W. A. Crowe.
Supt. Stations: K. E. Ross.
Div. Station Supervisors: E. T. Best, C. B. Nutt, P. P. Jones, T. R. Cowen.
Mgr., Rev. Acctng.: F. G. Bates.
Pur. Agent: W. W. Barber.
Chf. Pilot: F. C. Nicholson.
Supt. Psgr. Svc.: S. S. Brunt.
Supt. Maint.: H. M. Cartwright.
Supt. Comms.: L. A. Watson.
Asst. to VP: J. W. Lewis.
Sup. Grnd. Ops.: W. A. Blackmon.
Gen. Counsel: Kilpatrick, Ballard & Beasley.

CARRIED REGULARLY on business trips between 50 key cities in the Middle Atlantic industrial area . . .

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CARRIED THRIFTILY by people who travel in groups of 10 or more and *save one-third* of the round-trip fare . . . an Allegheny exclusive!

ALLEGHENY

AIRLINES . . . 20 years of Scheduled Service
Washington National Airport, Washington 1, D. C.

10 Years of Progress

America's 13 Local Service Airlines in 1958 served 516 cities, 283 of them exclusively, as compared to 214 cities, 122 exclusively, in 1948. They flew 198,000 plane miles daily in 1958 as compared to 45,944 plane miles daily in 1948.

F. W. Hulse

Southern Airways, Inc.
Atlanta Airport
Atlanta, Ga.

First scheduled service started June 10, 1949. Now serving 20 cities, 2,019 system route miles, 13 Douglas DC-3's, 515 employes.
President: Frank W. Hulse.
Vice President: Ike F. Jones.
VP-Sales: Graydon Hall.
VP-Ops.: W. S. Magill, Jr.
Secty-Treas.: Geo. F. Estey.
Asst. Treas.: C. H. D. Tarrer.
Gen. Sales Mgr.: Arch D. Yawn.
Dir. Mil. Transpt.: M. W. Nolan.
Supt. Psgr. & Flt. Svc.: G. H. O'Brien.
Dist. Sales Mgrs.: Harold Goodson, R. E. Kale, Perry Wingo, J. O. Lasseter and Ben E. Bowie.
Traff. Mgr.: Fred A. Shine.
Acctng. Sup., Gen.: R. W. Burden.
Dir. Research: J. K. Courtenay.
Pur. Agent: Dave Cannon.
Personnel Dir.: Everett Martin.
Supt. Stations: George F. Attwood.
Chief Pilot: W. B. Grubb.
Chf. Stewardess: Mrs. Barbara Spires.
Supt. Maint.: George Cross.
Chf. Insp.: Fred McMickle.
Chief Dispatcher: Truman Terry.
Supt. Comms.: W. C. Weigle.
Supt. Reservs. & Tck. Offices: D. R. Hankins.
Corp. Counsel: William B. White, Jr.
Wash. Counsel: Cecil A. Beasley, Jr.

R. E. McKaughan

Trans-Texas Airways
International Airport
Houston 17, Texas

First scheduled service started Oct. 11, 1947. Now serving 42 stations, over 50 cities, 4,456 system route miles, 25 Super Starliner DC-3's, 720 employees.
President: R. E. McKaughan.
VP-Pub. Affairs: J. K. Ayer.
VP-Traffic & Sales: L. J. Eichner.
VP-Ops.: H. E. Erdmann.
VP-Purchasing: W. C. Leatherwood.
VP-Personnel: Phil Reid.
Asst. to VP-Ops., C. L. Baker.
Flight Asst.: Marvin Brooks.
Asst. to VP-Tfc.-Sales: Jack Howe.
Treas.: M. L. Muse.
Dir. Properties: R. E. McKaughan, Jr.
Gen. Sales Mgr.: B. K. Gover.
Mgr. Interln. & Agency Sales: J. W. Beck.
Dist. Sales Reps.: J. A. Allbright, Houston; W. W. Blanton, Dallas; C. P. Briggs, San Antonio; K. P. Banff, Valley; J. B. Fleming, Shreveport; K. Daugherty, Beaumont-Pt. Arthur; T. Kamel, Austin; Bob Meredith, Arkansas.
Dir. Pub. Rels.: Bill Newkirk.
Chf. Accountant: H. H. Farr.
Mgr. Tariffs: G. J. Barbier.
Acctng. Sup., Rev.: A. C. Sandifer.
Mgr. Stores: F. C. Buck.
Mgr. Mach. Acctng.: T. K. Phelan.
Sup. Print Shop: M. M. Kelly.
Dir. Research: J. C. Crawford.
Dir. Station Operations: J. L. Herring; **Asst.:** W. W. Franklin.
Regional Directors: Jim Martin, Western; T. O. Brinkley, Eastern.
Chf. Pilot: L. A. Downes.

LOCAL SERVICE AIRLINES
Number of Employees
Year 1958

Carrier	Beginning of Year	End of Year	% Increase
Allegheny	850	855	0.6
Bonanza	385	436	13.2
Central	436	450	3.2
Frontier	719	913	27.0
Lake Central	406	412	1.5
Mohawk	727	732	0.7
North Central	1,232	1,399	13.6
Ozark	774	808	4.4
Pacific	472	560	18.6
Piedmont	881	931	5.7
Southern	518	581	12.2
Trans-Texas	665	659	(0.9)
West Coast	487	589	20.9
Totals	8,552	9,325	9.0

Chf. Dispatcher: W. J. Schoen.
Dir. Psgr. Svc.: Harry Rodgers.
Dir. Maint.: H. P. Whatley.
Supt. Maint.: T. O. Weathers.
Supt. Comms.: E. W. Helken.
Sup. Reservations: M. O. Poupart.
Wash. Counsel: V. L. Gingerich.

Nick Bez

West Coast Airlines, Inc.
Boeing Field,
Seattle 8, Wash.

First scheduled service started Dec. 5, 1946. Now serving 42 cities, 2,200 system route miles. Soon to serve 21 additional communities along 1,564 additional route miles. 14 Douglas DC-3's, 6 Fairchild F-27's, 617 employees.
President: Nick Bez.
VP-Planning & Engineering: E. B. Code.
VP-Community & Pub. Rels.: Tom Croson.
VP-Admin. & Legal: Herman F. Scheurer, Jr.
VP-Maintenance: S. M. Selby.
VP-Operations: S. R. Severtson.
Scty.-Treas.: Lewis J. Hawkinson.
Asst. Treas.: K. N. Laurin.
Dir. Personnel: J. S. Beard.
Dir. Sales: R. L. Snead.
Asst. to VP-Operations: H. E. Wallis.
Mgr. Cust. Rels.: B. O. Baker.
Mgr. Cabin Services: Nick Bez, Jr.
Mgr. Adv. & Pub. Rels.: Douglas Billmeyer.
Mgr. Employment: R. S. Heath.
Mgr. Traffic: R. E. Hill.
Mgr. Reservations: Clyde Kostenbader.
Mgr. Ground Ops.: H. G. Scull.
Mgr. Flight Ops.: Shelby Tuttle.
Pur. Agent: Morris Johnson.

10 Years of Progress

America's 13 Local Service Airlines in 1958 operated a fleet of 247 transport aircraft in service, as compared to 63 planes in 1948. They carried 4,583,656 passengers in 1958, as compared to 427,000 passengers carried in 1948.

TRANS-TEXAS AIRWAYS

FASTEST-LOWEST COST
Local Service Airline

FASTEST FLYING TIMES* (MILES PER HOUR)		LOWEST OPERATING COST* (CENTS PER REVENUE MILE)	
TTA Super Starliner	**159.5**	**TTA Super Starliner**	**101.42**
DC-3 Average	146.3	DC-3 Average	121.64
Mixed Fleet Average	150.0	Mixed Fleet Average	150.88
All Carriers Average	147.8	All Carriers Average	132.38

CAB Form 41 Reports, 4th Quarter, 1958, Local Service Airlines

friendly TTA

TTA — first with Super Starliners.

TTA — fastest local service airline.

TTA — the only one of 13 local service airlines to pay a cash dividend.

Keeping pace with the South and Southwest

TRANS-TEXAS AIRWAYS
Route of the Super Starliners

Analysis of 4 Central Airlines Markets

(Ticket Sales at Intermediate Stations Only for Terminal Designated, April 16 to May 15, 1959)

Market	Total Tickets	Same Day Commuter Tickets	%	Interline Connecting Tickets	%	One-Way Local Tickets	%	Round Trip Local Not Returning Same Day Tickets	%
Lawton-Dallas/Fort Worth	334	12	4%	262	78%	42	13%	18	5%
Joplin-Kansas City	294	49	17%	131	45%	80	27%	34	12%
Duncan-Dallas/Fort Worth	90	9	10%	57	63%	13	14%	11	12%
Ponca City-Tulsa	45	2	4%	33	73%	9	20%	1	3%
TOTAL	763	72	9%	483	63%	144	19%	64	8%

COMMUTER TRAFFIC

(Continued from page 76)

sult has a commuter service on the same flights provided between Lawton and Dallas/Fort Worth. The highway mileage distance is 181 miles between Duncan and Dallas and the airline distance, 125 miles. During the period of the survey, 10% of the ticket buyers at Duncan were planning to return to Duncan on the same day; 63% of all of the Duncan passengers were making interline connections at Dallas or Fort Worth.

Between Ponca City and Tulsa, with a highway distance of 98 miles and air distance (as flown by Central via Bartlesville) of 100 miles, only 4% of the traffic (two passengers in the thirty day period) bought tickets providing for a return to Ponca City on the same day. Service provided by Central was an 8:35 a. m. departure from Ponca City arriving Tulsa at 9:26 a. m. and returning from Tulsa at 8:40 in the evening, arriving Ponca City at 9:33 p. m. A total of 73% of the Ponca City ticket sales to Tulsa were making connections at Tulsa with other airlines for distant points.

In total, for the above four markets, only 9% of the total traffic was of the "commuter" variety. In no case did the amount of the commuter traffic reach an average of over 1.5 passengers per day, even in those markets where ideal commuter schedules are provided. The schedules must also make good connections with other airline service at the terminal cities in order to serve the overwhelming majority of the traffic which is interline in nature.

Central feels that the commuter and other truly local traffic offer the greatest potential field for new traffic. To this end, Central's summer advertising will feature "beat the heat" of the highways by flying.

Central also feels that, in areas where distances are great between intermediate points and major trade centers, the air commuter with adequate schedules may become a greater user of air travel. Central presently offers a good usable commuter service in 27 market pairs where permitted by scheduling that also meets excellent interline connections.

MOHAWK Airlines Inc.

78% MORE OPERATING HOURS WITH Airwork OVERHAULED ENGINES

During the first 4 months of 1957, we averaged 776 operating hours per engine with 64.7% utilization. The engines came from 3 different overhaul shops.

In 1958, with all engines overhauled by Airwork, we are now up to 1378 hours with 98.4% utilization. Another 100-hour extension is being considered.

E. A. "BUD" BUTTERFIELD
Supt. of Maintenance

R. R. TAYLOR
Director of Maintenance

BRANCHES IN
WASHINGTON
NEWARK MIAMI NEW YORK
ATLANTA CLEVELAND

Airwork CORPORATION
Millville, New Jersey

Bonanza Airlines

BONANZA Air Lines, as a local service carrier, is considerably involved in commuter business. Much of our traffic, however, is interline — that is, providing outlying areas with morning or afternoon service to a major terminal where connections are made to coastal and other regional flights. Our commuter traffic is comprised mainly of salesmen traveling between an outlying area and a major terminal, whose company has allied or associated offices in both cities.

We have spent a great deal of time in the field contacting businesses in

order to determine how many salesmen they have traveling or how many sales people and from what firms travel in to see them. Then these people are contacted by our local sales staff in an effort to persuade them that air commuting is far the most profitable and time saving. There is undoubtedly need for greater education of the public; Bonanza coordinates its advertising with trunk carriers who have greater budgets for educational purposes and for the dissemination of general information.

We feel there is definitely a need for commuter service; however, commuter service, we find, is not limited to a passenger leaving in the morning and returning that evening, but rather leaving the intermediate cities, connecting at a major terminal, and returning perhaps a few days later, so the return portion of his commuting may be on a morning flight or an evening flight. Private automobiles are definitely competition and our method of combating this has been the very effective use of billboards strategically located between points served by us.

It is also our feeling that excursion fares will tend to increase the diversion to air travel from the automobile. Along this line Bonanza has inaugurated excursion fares over most of its system on an experimental basis. While some carriers feature coach fares, Bonanza feels the coach-type fare lacks the added advantage of peak-period traffic control that can be obtained through the excursion tariffs especially designed to encourage travel in slack periods. Bonanza's concept of service to the public, whether commuting or connecting traffic, is — first — good timing of terminal arrival and departure times to connecting carriers. Frequency without over-scheduling is perhaps the next most important consideration. Bonanza's advertising policy generally follows our concepts by featuring destination-frequency-convenience. Bonanza's system also lends itself to resort travel, and Bonanza has instigated a strong program of package tours to the many resorts it serves. Early indications show that Bonanza's "Variety Vacation" tour program will be successful.

Frontier Airlines

DURING the 13 years that Frontier Airlines has been serving the Rocky Mountain West and, more recently, 27 new cities in the Midwest, there has been a continuing program of selling commuter air service flights. Almost half of Frontier's newspaper, radio and television advertising stresses the importance of flight departures, flight arrivals at likely destinations, and savings which can be affected by the better use of one's time, which would otherwise be spent in car travel to and from these destinations.

During Frontier's experimentation with schedules, we have found that the one-day commuter usually travels from our larger terminal cities of Denver, Albuquerque, Phoenix, Salt Lake City, Billings, Omaha, Kansas City and Grand Junction, Colorado, to one of our intermediate communities, with a return home that evening. For this reason, Frontier flight schedules are geared for an early morning departure from these terminal cities, with a late afternoon or early evening return — giving the average businessman the bulk of a business day at his destination.

It has been found that the average small-town businessman who travels to a terminal city prefers to overnight at his destination before returning home. This businessman likes to include an evening of visiting friends, taking in a ball game, or enjoying the attractions of one of the supper clubs before he wraps up his plans for returning home. For this reason, Frontier's scheduling of flights is usually

Speed and extra comfort on the new...

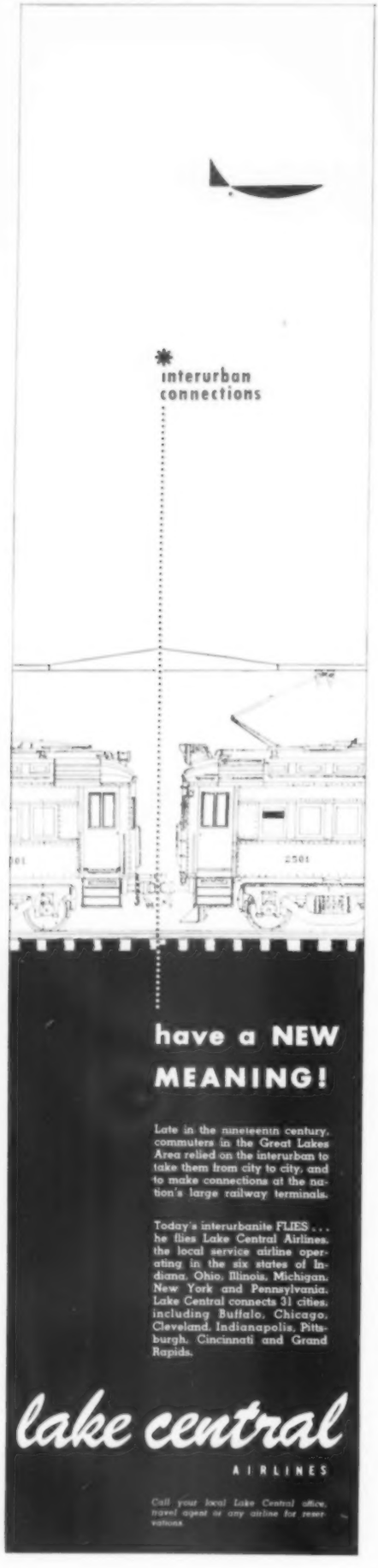
luxurious **Super Northliner** flights

Swift, smooth, radar-equipped Convair Super-Northliners joined the Northliner fleet in daily service between key North Central route cities on April 26 : . . the latest advance in the continuing progress of North Central — America's leading local airline — first in its class in passengers, air mail and air express.

Progressive route expansions have extended North Central's system to approximately 5000 route miles — with fast, frequent, dependable service to 65 key cities, and their hundreds of adjacent communities in a nine state area.

NORTH CENTRAL AIRLINES

Serving 65 key cities in 9 states: Minnesota • Michigan • South Dakota
Iowa • Nebraska • Wisconsin • Illinois • North Dakota • Indiana


interurban
connections
have a NEW
MEANING!
Late in the nineteenth century, commuters in the Great Lakes Area relied on the interurban to take them from city to city, and to make connections at the nation's large railway terminals.
Today's interurbanite FLIES . . . he flies Lake Central Airlines, the local service airline operating in the six states of Indiana, Ohio, Illinois, Michigan, New York and Pennsylvania. Lake Central connects 31 cities, including Buffalo, Chicago, Cleveland, Indianapolis, Pittsburgh, Cincinnati and Grand Rapids.
lake central
AIRLINES
Call your local Lake Central office, travel agent or any airline for reservations

tied in with a late morning arrival at these terminal cities. This gives the air traveler from a small community a full afternoon in the larger metropolitan city, with a choice of early morning or early afternoon return schedules the following day.

Approximately 40 per cent of the tickets sold on Frontier Airlines are round trip tickets. In the fall of 1958 and in March of 1959, Frontier made a survey of round trip and commuter travel. We have found that 20 per cent of our passengers are commuter travelers. The bulk of these passengers are salesmen representing large wholesale firms in our terminal cities, representatives of federal and state governmental agencies, professional consultants in the medical, accounting, engineering and legal fields. Most of these travelers had formerly driven their cars, and usually need a car at their destination. In order to bridge this weak link in air transportation, rental car services have been established by such national agencies as Hertz, Avis and National Rent-A-Car agencies, with occasional independent car agencies operating at various intermediate or terminal cities.

Frontier Airlines' average passenger flies 260 miles in making his trip. This is considerable above the national average for the local service airlines. This rather long haul for a local service operation can be based on the distances, which are greater between larger terminals throughout the Rocky Mountain West served by Frontier Airlines, plus the fact that mountainous terrain in much of this area makes surface transportation a very tiresome and time-consuming project.

Since the greatest potential for increasing commuter air traffic on Frontier Airlines is to entice the traveler who normally uses his car to "try his next trip by air," Frontier has engaged in a wide-spread highway billboard advertising program. Most of these billboards are of a clever, humorous theme, and convey the Frontier commuter message at points where the highway traveler is most receptive to them. Messages contained on some of the billboards are: "Had enough? Next time fly Frontier!", or, "This traveler flew Frontier; this traveler drove his car.", or, during the winter months, the billboard carries the theme, "Fly over ice and snow — Fly Frontier!" All of these billboards are placed at the top of mountain passes, and also contain a humorous cartoon to illustrate the message. Psychologically, they "hit the spot," because we have had a number of our passengers who have been converted to air travel remarking that the billboard "caught his eye" after becoming fatigued in driving the 200 or 300 miles over winding, mountainous roads.

Frontier plans to enlarge upon its commuter service theme, particularly as it adds additional flights over its high traffic density routes. Billboards, plus newspaper, radio and television advertising, will continue to promote this travel market. Frontier's on-line credit card will also be made an attractive part of this program, so that passengers can "Fly now, pay later!"

Lake Central Airlines

APPROXIMATELY 65 per cent of Lake Central's passengers are traveling to points beyond our area. This means the bulk of our traffic is feeder or interline traffic, rather than commuter traffic.

Our small percentage of commuter traffic is due to our short length of haul. According to the year-end statistical report published by Ray and Ray, Lake Central's average length of journey for 1958 was 69.8 miles, the shortest in the local service industry.

In our area, the automobile is our greatest competitor, and the situation is not likely to improve over the years. As more and more super highways are constructed and the operating costs of the automobile decrease (note increase of smaller and foreign car sales), competition by the auto for short-haul traffic will increase.

Although we are constantly making efforts through advertising to increase our commuter traffic, we feel the ultimate answer will come by increasing our average length of journey, and this can only be done by the Civil Aeronautics Board. By sharply increasing the size of carriers such as Lake Central and liberalizing their certificates to allow more skip-stop authority, especially on an experimental basis, we feel a sharp increase in commuter traffic would result. In order for Lake Central to effectively compete for commuter traffic with the automobile, we must increase our average length of journey by 80-130 miles, meaning our average length of journey would be between 150 and 200 miles.

When the CAB has re-aligned the routes and the locals have effected a longer length of haul, it will then be necessary for the carriers to offer adequate commuter service between points on their systems.

Until the CAB sets the stage, Lake Central management sits poised for action, with policy established and equipment planned to provide fast and convenient service for the commuter traffic which is so vital to local service airlines.

*This modern ERWIN-NEWMAN Suspended Cantilever hangar, at Westchester County Airport, White Plains, N. Y., is the joint base for three large executive fleets of General Electric, American Can and U. S. Industries. The 133′ depth and 640′ width efficiently hangars executive plane fleets of any size.

Completely Unobstructed CLEAR SPAN *for the Most Efficient* HANGAR UTILIZATION

ERWIN-NEWMAN Suspended Cantilever Type construction eliminates the outmoded hangar problem of having to spot planes in a hangar full of obstructing supporting columns. From one end to the other there is nothing but wide open unobstructed clear span hangar work area when you construct a modern ERWIN-NEWMAN hangar.

ERWIN-NEWMAN hangars are built with an expandable future in mind. The length can be enlarged and still have clear span space up to several hundred or several thousand feet. Vertical clearance can be increased, in the future, by adding tail gates at any number of points across the front.

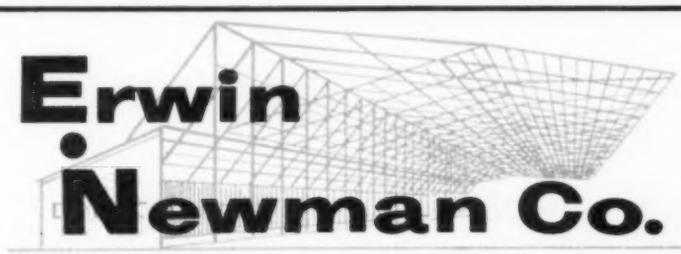
Our many years of specialized hangar design and construction experience can offer you valuable information and money saving ideas throughout the entire planning period of any hangar project (no obligation of course). You're invited to outline your plans in a letter, or call. ERWIN-NEWMAN will be glad to meet with you for talks on preliminary plans or any stage of planning.

Due to certain patent infringements it is necessary to publish this:

IMPORTANT PATENT NOTICE

THE ERWIN-NEWMAN SUSPENDED CANTILEVER HANGARS ARE COVERED BY UNITED STATES PATENT No. 2,687,102, and similar foreign patents issued to us and under which we hold exclusive rights. We have not (at this writing) issued any licenses or other authorization for the design, engineering, construction, or use of these patented hangars. The Erwin-Newman Company must, and will, protect its rights under these patents against infringements.

- Single Cantilever
- Double Cantilever
- Facing Cantilever



Erwin Newman Co.

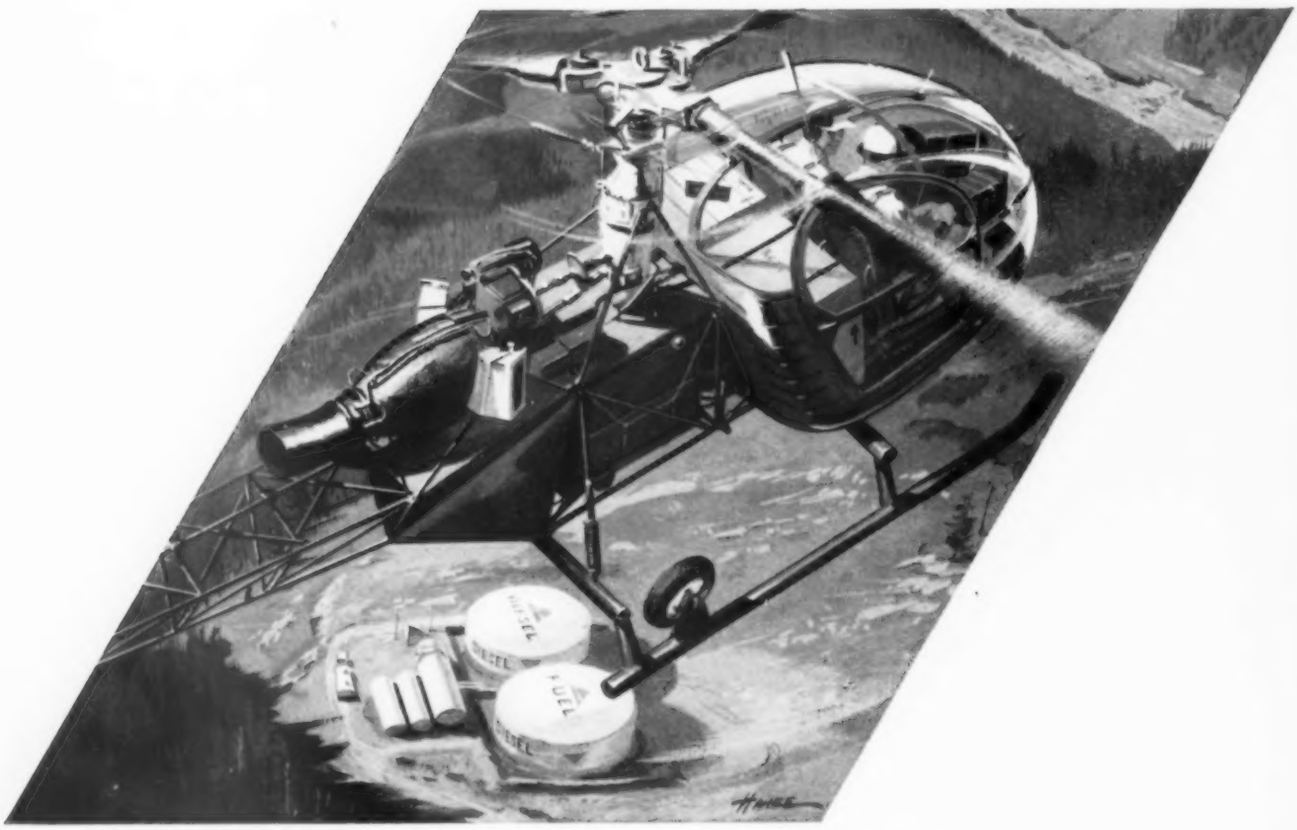
Designers and Constructors

- Any Height
- Any Length
- Any Depth

P. O. BOX 1308 • PHONE JAckson 4-8186 • HOUSTON, TEXAS

DIESEL---

YOUR EVERYDAY FUEL IS USED BY THE ALOUETTE



Diesel, the low-cost, widely-available, easy-to-handle fuel, is standard for Alouette consumption. Now the modern, cost-conscious Alouette operator has a choice of four fuels . . . JP-1, JP-4, 640 Kerosene . . . and diesel. Such fuel flexibility is unmatched by other operational helicopters.*

Jet-powered Alouette's dependable versatility, and its compatibility to diesel fuel . . . found almost anywhere . . . make a daily routine of operations in areas that up to now were all but inaccessible.

In offshore oil operations or geodetic surveys, naval and marine work or powerline inspection in mountainous country, desert operations or cargo transport in below-zero weather, the Alouette can and is doing the job. . . . faster, more dependably and at lower cost.

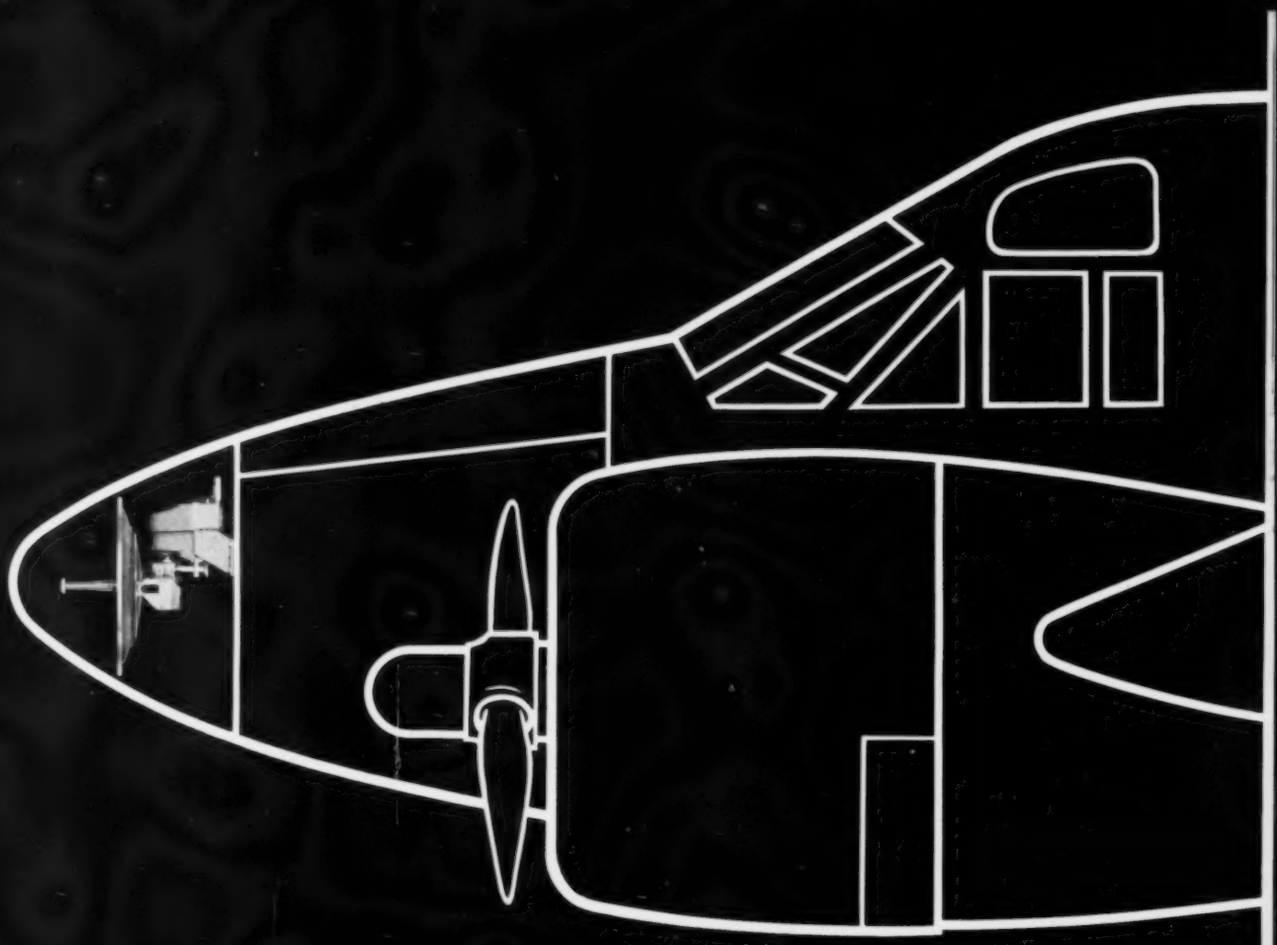
**Designed by Sud Aviation*

CONTACT HELICOPTER DIVISION FOR LITERATURE AND DEMONSTRATION — EARLY DELIVERY.

REPUBLIC AVIATION CORPORATION

HELICOPTER DIVISION

FARMINGDALE, LONG ISLAND, N. Y.



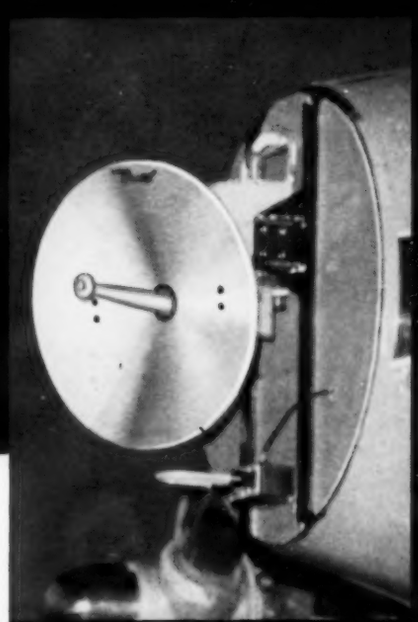
NOW... FULL RANGE WEATHER RADAR

available for the Twin-Beech

With the introduction of the new Bendix 18-inch *stabilized* radar antenna, operators of D-18 and E-18 Twin-Beeches can now enjoy the safety and convenience of a *full 135-mile*† range weather avoidance radar system. Scanning 120 degrees ahead of the aircraft, this new antenna is designed to be used with the Bendix* RDR-1D Radar System. Weather targets are clearly visible on a large five-inch indicator. The entire system weighs only 90 pounds. Radomes are readily available for easy installation.

For further information, contact your local dealer or write Bendix Radio, Dept. 281, Baltimore 4, Maryland.

†Nautical miles
*Reg. U.S. Pat. Off.



Bendix Radio Division

Baltimore 4, Maryland

Bendix AVIATION CORPORATION

Export Sales & Service: Bendix International Division, 205 E. 42nd St., New York 17, N. Y.

FLY THE EFFORTLESS WAY

with the *Levelair* by TACTAIR

LOW COST AUTOMATIC FLIGHT SYSTEM

Here's what you want to make flying in your Cessna the last word in travel ease and restful transportation – the remarkable new Levelair by Tactair, a superior, low-cost automatic flight system developed for Cessna by Tactair, leading builder of automatic pilots for business aircraft.

You'll be amazed at what the Levelair will do for you. You stay on course unerringly, you have all the time you need to look for traffic, check your maps, work your radio. In rough air, Levelair does all the work, smooths out your ride. If you fly instruments, all the problems of keeping straight and level while you're busy at other duties are eliminated. Whether you're a brand new private pilot, experienced VFR or IFR pilot, you'll welcome the assist the Levelair gives you. Takes all the work out of flying, leaves all the fun for you.

The Levelair is approved for the Cessna 175, 180, 182 and Skylane. If you're ordering one of these fine Cessna airplanes be sure to specify Levelair as factory-installed equipment. Or your Cessna dealer can easily and quickly install the Levelair in your present Cessna.

TWO *Levelair* MODELS OFFERED

T-1 LEVELAIR. Holds your Cessna unerringly straight and level. Smooths out rough air, keeps you level while your attention is diverted to map reading, radio work or other flight duties. Completely non-electric. Operates controls smoothly, with trouble-free pneumatic bellows. Factory installed price –
$ 795 *on Cessna Skylane*
$1165* *other models*

T-2 LEVELAIR. Incorporates famous Tactair Course Selector and Heading Lock. Just set any heading you wish on the Tactair Directional Gyro. The T-2 will fly it to the exact degree. Your Levelair will automatically turn to any new heading you desire *as if by magic!* And there's no confusing zero heading. Makes flying a VOR, ADF or ILS course so easy. Only Tactair offers this exclusive feature. Factory installed price –
$1095 *on Cessna Skylane*
$1610** *other models*

*Includes artificial horizon and complete vacuum system – these, plus a directional gyro, are already standard equipment in the Skylane.

**Includes artificial horizon, directional gyro and complete vacuum system – all of which are standard equipment in the Skylane.

AUTOMATIC FLIGHT – As Important As Radio In Today's Busy Aircraft!

See your Cessna dealer now for a Levelair demonstration.

TACTAIR®
INCORPORATED
DIV. OF AIRCRAFT PRODUCTS CO.

BRIDGEPORT, PENNSYLVANIA
(SUBURBAN PHILADELPHIA)

FOR 18 YEARS SPECIALISTS IN PRECISION AIRCRAFT PNEUMATIC AND HYDRAULIC CONTROLS

Following many months of research and engineering on the Douglas-built B-26, we are pleased to announce that we are going into production on an executive version of this famous airplane. Details will be announced at an early date.

L. B. SMITH AIRCRAFT CORPORATION

INTERNATIONAL AIRPORT • MIAMI, FLORIDA

LOOK FOR THIS SYMBOL

IT IDENTIFIES AN AIRPORT OPERATOR who handles top quality aircraft supplies, readily available from the well-stocked warehouses of Van Dusen Aircraft Supplies. Your local VALUE DEALER has in stock much of the equipment needed to keep you flying . . can be relied on for prompt procurement of all the fine aviation products of more than 250 leading manufacturers. Whatever his location, he is conveniently close to one of the eight Van Dusen facilities across the nation.

2004 LYNDALE AVENUE S.,
MINNEAPOLIS

LOVE FIELD,
DALLAS

TETERBORO AIRPORT,
TETERBORO, N. J.

LOGAN INTERNATIONAL AIRPORT,
BOSTON

BEACON FIELD,
ALEXANDRIA, VA.

BYRD FIELD,
RICHMOND

MIDWAY AIRPORT,
CHICAGO

MIAMI INTERNATIONAL AIRPORT,
MIAMI

Export Division:
VANDUSAIR,
Teterboro, N. J.

Van Dusen **AIRCRAFT SUPPLIES**

Fastest Growing Aircraft Supplies Firm In The Nation

Flying Over Central Texas...

...Map your stops at the Humble Sign

HUMBLE *aviation gasolines and lubricants are available at these airports in the central part of Texas:*

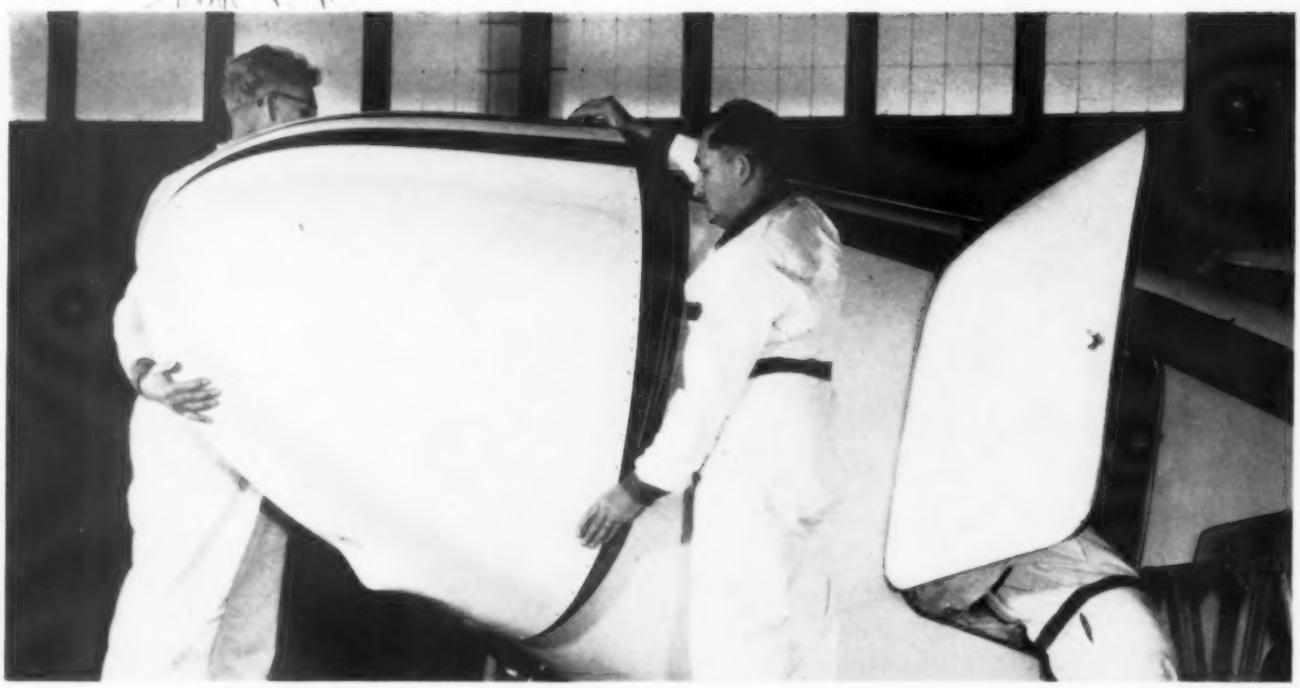
Anahuac—Chambers County Airport
Angleton—Angleton Airport
Baytown—North Main Airport
Belton—Belton Airport
Bonham—Bonham Airport
Bryan—Coulter Field
Cameron—Cameron Airport
Dallas—Love Field
Dallas—Addison Airport
Dallas (Irving)—Jap Lee Airport
Dallas—Redbird Airport
Decatur—Long Airlanes
Denton—Denton Municipal Airport
Fort Worth—Amon Carter Field
Galveston—Galveston Municipal Airport
Genoa—Emmett Flying Service Airport
Giddings—Giddings Airport
Grand Prairie—Grand Prairie Municipal Airport
Houston—Collier Airport
Houston—Houston International Airport
Katy—Franz Airport
Killeen—Skylark Field
Mexia—Mexia Municipal Airport
Pearland—Pearland Airport
Rosenberg—Lane Airpark
Sugarland—Hull Field
Texas City—Gulf Coast Airport

When you taxi up to the Humble sign, you can be sure that your plane will receive prompt, careful service. The tanks will be topped off with Humble Aviation Gasoline — a gasoline that is carefully balanced for optimum power and economy. Refined beyond other gasolines, it achieves full knock ratings with less lead content. This reduced lead content means less spark plug fouling, less engine deposits, increased life of engine parts, and increased intervals between engine overhauls.

For pleasant flying through the sunny skies of Texas, make all your flight stops at airports where Humble aviation products are available.

HUMBLE
AVIATION PRODUCTS
HUMBLE OIL & REFINING CO.

for DEPENDABILITY...



...see OHIO AVIATION for RADAR INSTALLATION

Modern radar equipment adds safety to flight, increases flying hours.

The Ohio Aviation Company, long known for its ability in the field of Radio Systems Engineering and up-to-date installation techniques, has carried this "know how" into the field of Radar Installation and Service.

The fine quality of an Ohio Aviation Radar Installation, coupled with efficient, expedient maintenance service, assures you of continued dependable operation of your Radar Equipment.

These are reasons why many owners of business aircraft insist on Ohio Aviation for radar service. The same *dependable* services are available to you. We invite your inquiry. Write, phone or wire Fred Aubry at Ohio Aviation for full information.

Custom radio panel nearing completion at Ohio Aviation Company

THE OHIO AVIATION CO. Dayton Municipal Airport • VANDALIA, OHIO

THE NEW U.S. ARMY MOVES

and there's a BELL in the Picture

Mobility . . on the ground and in the air . . that's today's new Pentomic Army. Well-equipped, hard-hitting Battle Groups . . geared for independent action . . can strike, disperse, concentrate . . with instant flexibility and control.

Mobility is vital to success on the modern battlefield . . and one key to the Army's mobility is its air vehicles. Bell, long a member of the Army team, helps the new Army see and *move*. Battle proven, battle tough, the Bell H-13H helicopter supports ground operations. And now, the Army's own turbine-powered Bell HU-1 helicopter . . a joint Army-Air Force-Bell triumph . . gives the Army greater air mobility . . gives it greatly improved performance and reduced maintenance. Bell is proud to be a part of the new Army's arsenal.

SUBSIDIARY OF
BELL AIRCRAFT CORPORATION
FORT WORTH, TEXAS

BELL
HELICOPTER CORP.

*

THE
STORY OF
TODAY'S
NEW ARMY
IS A
STORY OF
PROGRESS..AND

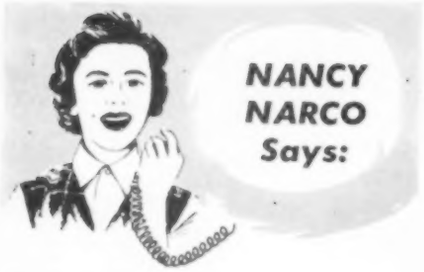
BELL

is helping make
Americans aware of
the vital necessity
of this modernization
program in keeping
our Army strong, *mobile*,
and ready to combat
the threat of
nuclear warfare.

**One of a series of ads currently appearing in such opinion-making publications as Fortune, Business Week and U. S. News & World Report.*

FORT WORTH, TEXAS | SUBSIDIARY OF BELL AIRCRAFT CORPORATION

BELL
HELICOPTER CORP.



Positive VOR Identification

With so many new Omni stations being added and frequencies of existing stations being switched around so fast, better be careful to check information given on regular Sectional or Regional (WAC) charts.

Case in point occurred just a few weeks ago. A pilot called in to say he had just passed the Caldwell, N. J., Omni and none of the landmarks looked right. And well they shouldn't have — he was 28 miles away from where Caldwell *used to be!* Caldwell was decommissioned about three months earlier and its frequency of 115.4 mc was assigned to Stillwater, N. J., Omni, 28 miles to the northwest. Our pilot, flying with a "current" New York Sectional chart, took a bead on what he thought was Caldwell, by tuning to 115.4 and he wound up quite confused, to say the least, over Stillwater.

Now, where he made his mistake was just assuming that the station he had tuned on 115.4 was Caldwell. He failed to check the code identification. If he had, he would have known that he was tuned to STW and not Caldwell.

This is a rather unusual case of the same frequency being switched to an Omni in the same general area, but it can happen.

Positive identification is also desirable because there might be several Omnis in the same area which are only one or two tenths of a megacycle apart. Check that identification positively before you start heading for any Omni station.

How can you keep up with all the frequency changes and new Omnis which are being plugged in? The hard way is to keep track of all notices in the Airmen's Guide. All changes, shutdowns, and new locations are published in the current issue, but might not show up in the good book a month or so later.

The best way is to use current radio navigation charts. These are revised every few weeks to show all changes and are a must for anyone actively using an airplane cross-country. Once you've started using them, the WAC and Sectional charts stay in the glove compartment, reducing cockpit clutter.

Radio charts make your whole cross-country work simpler, more certain, more business-like. Two subscription services are available—either the Coast and Geodetic Survey, Washington, or Jeppesen in Denver. You can subscribe for just the radio chart service or get the full treatment including all instrument approach procedures.

With up-to-date radio facility charts and good radio equipment, cross-country is a cinch—and a lot less confusing.

Regards,

Nancy

NARCO • Fort Washington, Pa.

ANNOUNCING

Another *narco*

ELECTRONIC TRIUMPH!

18-OUNCE • COMPLETELY SELF-CONTAINED

3-LIGHT

MARKER BEACON RECEIVER

narco MBT

Here's great news for single and twin-engine owners — an airline-type three-light marker beacon receiver that weighs only 18 ounces and is priced at a fraction of the cost of similar equipment now on the market.

The Narco MBT gives you positive identification of airways and LF range Z markers (white light); ILS outer markers (blue light) and middle markers (amber light). Provides aural identification as well.

And it's all completely self-contained! No separate power supply; no complicated wiring; no shock mount needed. Case measures less than 3½" by 1⅛" by 6", can be quickly and easily panel-mounted. You'll find the Narco MBT so useful and helpful, so many ways.

MOUNT EITHER WAY

Unique face panel is etched on one side for horizontal mounting, on the other side for vertical mounting.

Priced at only $230

Less antenna and cables

RUGGEDIZED, SIMPLIFIED, SUPER-RELIABLE

Simplified superheterodyne design with ruggedized construction throughout, plus hermetically-sealed units, heavy-duty transistors and printed circuitry, combine to give the *narco* MBT exceptional reliability. Can be expected to give long, trouble-free service. Fantastically low power drain of only 0.005 amperes. Has "Press to Test" lights, variable dimming.

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See your Narco distributor or write for information on this fine Narco equipment.

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NATIONAL AERONAUTICAL CORP., FORT WASHINGTON, PA.

world's FASTEST...

MISS JERRIE COBB, on April 13, 1959, at the World Congress of Flight, Las Vegas, Nevada, flew an Aero Commander 680E to a NEW WORLD SPEED RECORD for aircraft in its weight category, over a 2000 kilometer course. Now the fastest, Aero Commander had previously established world records for distance and altitude in 1957.

AERO COMMANDER

Another product of ROCKWELL-STANDARD Corporation

LOOK TO THE LEADER IN BUSINESS AIRCRAFT

AERO DESIGN & ENGINEERING CO • BETHANY, OKLAHOMA

First vertical takeoff-landing transport, Air Force's 16½-ton Hiller X-18 tilt-wing, now in test at Edwards AFB. Power: Two Allison T-40 turboprops totaling 11,070 hp plus 3,400-lb. thrust Westinghouse turbojet for transition and hover control; approved with Champion Jet Igniters. (Champion pioneered jet igniter development with experimental engines in '42, remains in forefront today.) Hiller Pres. Stan Hiller predicts "inevitable conversion of entire transport system to VTOL."

Project Engineer M. F. Gates uses smoke filament t check entrainment of ambient air by downward deflec jet flow" in VTOL lift project. Basic research contract external jet mixing was awarded Hiller's Advanc Research Division. (New high-temperature adhesives su sidiary puts Hiller into space race.)

"...feet planted square in mid-air..."

A behind-scenes report on Hiller Aircraft Corporation... one in a series on why helicopters and VTOL aircraft, like the world's airlines and business fleets, use Champion Spark Plugs

"Look, man! No hands!" Without hands on controls, pilot demonstrates hovering stability of Hiller ducted-fan "Flying Platform." Nelson H-53 engine manufacturer worked with Champion, mating plugs to engines during development stages. Now underway are three separate military ducted-fan projects—outgrowth of unconventional flight concepts proved by Flying Platform. One is development of experimental vehicle in higher speed range for Bureau of Aeronautics.

Hiller XROE-1 Rotorcycle, world's smallest collapsible 'copter, can be unfolded by one man and flown in less than five minutes! Pilot models of the Champion-fired Rotorcycle are scheduled for delivery to Marines shortly. Test engineers found Champions mandatory to ensure dependability of 45-hp, 290-lb. Rotorcycle.

Perched on a mountain top doing a commercial job is the new Hiller 12E. The Champion-equipped, 305-hp 12E is the most powerful production 'copter in the 3- to 4-place class, Hiller reports. First deliveries of the lightweight commercial 12E are in progress. Hiller is aiming for 50-50 commercial and military sales. (Nearly 80% of total Hiller business in 1958 was military.)

Turbojet blade-tip propulsion model takes shape from drawing boards . . . possible solution to large helicopter flight problems. Hiller experts on Army-Navy project are (l/r) C. W. Messinger, "Tip-Turbo" Project Engineer; J. B. Nichols, Manager-Advanced Planning. Hiller tip-propulsion experience includes thousands of flight hours with ramjet rotorcraft.

by **HERB FISHER**

...national aviation authority, veteran test pilot, author

...Fisher

"You just strap it on like skis, give it some throttle—and you've got your feet planted square in mid-air!"

That simple, says the test pilot who first "walked on air" with the unconventional ducted-fan Flying Platform strapped to his feet. You wonder how some of Hiller's research craft can fly . . . but then, aerodynamics is still puzzling the flight of the all-wrong bumble bee. He flies. And so does Hiller—with phenomenal success!

Founded in 1940 by 17-year-old mechanical genius Stanley Hiller, Jr., Hiller Aircraft Corporation is rightly famed for two things: Volume-supplying a vast military and civilian market with light helicopters noted for efficiency as well as operating and maintenance economy. And pioneering "years-ahead" flight concepts to *reality*.

Visionary Stan Hiller and his lab and design team sent aloft the world's first co-axial aircraft four years after the company's founding.

Next came this country's first jet torque-compensating 'copter.

Soon afterward, the unconventional Flying Platform. First of its kind. Completely revolutionary! Forerunner of a whole new era of ducted-fan flight (wait and see!) . . .

Then the 290-lb., collapsible, one-man XROE Rotorcycle. A virtual flying motorcyle! The Marines snapping up first test models . . .

And—the nation's first vertical takeoff transport, the VTOL/STOL X-18, a turbine-powered 33,000-lb. research giant currently under test at Edwards Air Force Base.

In the works at Hiller are more research craft destined to lift the eyebrows of old-time fixed-wing test pilots like myself (until we remember the bumble bee and Hiller's knack for taking the bugs out of "bumble bees").

Production-wise, backbone of the 61-acre Hiller operation at Palo Alto, Calif., is the Army H-23D "Raven" helicopter with its Lycoming VO-435 engine and the higher powered civilian version, the new 12E, with its 305-hp Lycoming. First deliveries on the lightweight, heavy-load-lifting commercial and business 12E began this Spring.

One of the many missions of the military-version Raven is primary trainer for all Army helicopter pilots. At Camp Wolters, Tex., world's largest helicopter operation, normal helicopter maintenance time has been slashed in half with a fleet of 200 Ravens!

Throughout these dramatic years at Hiller—from first light 'copters to as yet unannounced giants with turbojet blade-tip propulsion and second-generation jet-lift VTOL's—Hiller and Champion Spark Plug Company have worked together. Closely. Developing technology in the vital area of ignition—heart and lifebeat of any machine that flies.

With Hiller, the military, and the engine manufacturer, Champion developed and tested new plugs for new flight requirements. Hiller further subjected these—and competitive plugs—to torture seldom experienced by a plug in actual use . . . even though normal 'copter cruise conditions approximate continuously those of regular aircraft at full-power takeoff. The result of this torture-testing is one reason Champion today remains 'way out front in spark plug and jet igniter development—and preferred by the world's major airlines and business fleets.

I haven't got space to detail Hiller tests. But I'll tell you about one, the brutal "tie-down": Hiller straps 'copters and VTOL's to test pads and runs engines—day and night, without letup—at continuous full-throttle, then 85% power! I'm telling you! If everything isn't up to missile-age par—especially those vital plugs—you can imagine the results!

Any wonder, then, that Powerplant Design Specialist Bob David directs Senior Buyer Gene Sparks to *specify Champions* when ordering the various engines Hiller uses?

Hiller has had a personal hand in tailoring the *dependability* of those plugs to torturous requirements — as Hiller tailors its research craft to fly *right!*

CHAMPION SPARK PLUG COMPANY • TOLEDO 1, OHIO

Whisking heavy loads anywhere is duck's soup for the powerful new lightweight commercial 12E helicopter with its Champion-fired 305-hp Lycoming VO-540 engine. Compared with its predecessor, the three-place commercial-executive 12E will transport 65% more payload, 50 miles farther, and hover in ground-effect four times higher.

This is the Super 680 Aero Commander which Pilot Victor Stadter flew nonstop from Belize, British Honduras, to Brownsville, Texas — after removing the left engine's propeller blades, cylinders and pistons. He climbed to 12,500 ft. after take-off and averaged 170 mph. for the 1,248-mile single-engine flight.

—(FLIGHT MAGAZINE Photo.)

1,248 Miles With One Engine Out

Aero Commander makes history again as pilot flies home with left prop removed

By TOM ASHLEY

BACK in 1951, we watched an Aero Commander make aviation history by taking off and flying 1,160 miles nonstop on one engine, the propeller removed from its left engine. We wondered then if somebody might eventually duplicate the feat, never before accomplished by any twin-engine airplane, but the odds seemed astronomically against a repetition — nobody besides the factory would ever have reasons compelling enough to do it.

But the odds ran out recently — an adventurous Texas bush pilot in Central America not only duplicated the historic flight but bettered it. On April 6, 1959, Victor Stadter of McAllen, Texas, removed the propeller blades, cylinders and pistons from the disabled left engine on his Super 680 Aero Commander at Belize, British Honduras, took off and flew 1,248 miles nonstop from Belize around Mexico to Brownsville, Texas.

Thus the Aero Commander, without fanfare, became the only twin-engine airplane ever to make two long-distance flights of more than 1,100 miles each on one engine from standing starts.

The first such flight was a factory demonstration, carefully planned and expertly executed to firmly establish the Aero Commander as a remarkable new kind of high-performance light twin and to launch its manufacturer as a very successful business aircraft enterprise. The prototype Aero Commander was used. It was powered by two 260-hp. Lycoming engines, but the left propeller was removed and stowed in the cabin. Loaded with 160 gals. of fuel, it grossed 4,853 lbs. — 53 lbs. overloaded. Pilots were Bert Bantle, chief engineering test pilot, and Emmett R. Morris, now chief of flight for the factory sales department. They had a hydraulic steering unit on the nosewheel to help them correct for the off-side power in the take-off run. Just before dawn on May 9, 1951, they took off from Will Rogers Field, Oklahoma City, and flew nonstop 1,160 miles to National Airport at Washington, D. C., in 7 hrs. 55 mins.

Vic Stadter's long single-engine trip is traced by this map. It began at Belize (bottom right), on the Caribbean Sea, crossed Yucatan Peninsula and followed coastline around Gulf of Mexico via Vera Cruz and Tampico to Brownsville.

—(FLIGHT MAGAZINE Map.)

Eight years later the Bantle-Morris feat was bettered by Victor Stadter. His Super 680 Aero Commander is powered by two supercharged Lycomings rated at 340 hp. each for take-off and 320 hp. each maximum continuous operation. His left engine, with approximately 900 hours of operation, was inoperative, its propeller blades, cylinders and pistons removed and carried in the cabin. With full tanks of fuel, capacity 223 gals., Stadter was grossing approximately 6,000 lbs. for his single-engine take-off. The mechanic refused to go, so Stadter's was a solo adventure. His Commander was equipped with nosewheel steering but it was inoperative. Why and how Stadter did it taxes the imagination but he managed to take off from Belize and fly nonstop 1,248 miles to International Airport, Brownsville, Texas, in 7 hrs., 15 mins.

Where the prototype Commander was cruised at 3,000 to 5,000 ft. above sea level, using 70% power and indi-

cating 125 mph. most of the way, Stadter's Super 680 Commander was cruised from 3,000 to 12,500 ft. above sea level, using 75% or more power and indicating 145 mph. and more most of the way. The 1951 single-engine flight averaged 147 mph. in ground speed, having an average wind factor of plus 15 mph., and the 1959 single-engine flight's ground speed averaged 170 mph., having little or no tailwind benefit.

As to why he did it, Stadter (pronounced "Stodder") simply says he couldn't afford to wait around at Belize for two weeks until a replacement engine could clear through U. S. Customs. He's in the nursery business, he says, and it couldn't wait. He had lost his left engine a few days earlier after taking off from Belize and climbing to 12,000 ft. He landed back at Belize and cabled to Upper Valley Aviation, his base of operations at McAllen, Texas. Stadter has the 680 Commander under lease from Upper Valley Aviation, whose owner, H. L. Ferguson, immediately sent a mechanic on the airlines via New Orleans to Belize. For repairs, the mechanic carried some pistons and cylinders in his bag as personal effects, clearing Customs without delay. But at Belize the mechanic found the bearings were seized tight, requiring a replacement engine and the two-week delay in transit.

The next day Stadter and the mechanic drained all but 40 gals. of fuel from the tanks and experimented with a single-engine take-off. Since there would be no hydraulic power from the inoperative left engine, hand-pumping would be necessary for brakes to retract flaps and gear. So the mechanic went along to do the hand pumping. Nobody ever pumped as fast as he did while Stadter eventually got up enough speed and control to make a single-engine take-off. It was in mid-afternoon, the tropic temperature up around the 100-degree mark, and both were dripping sweat upon landing.

"Mañana," said Stadter to the mechanic, "we go to Texas!"

"Not we, Señor," replied the perspiring unbeliever, "but you!" With that he knelt down and kissed the ground. "I like it here — you like it up in the clouds. You go. I stay!"

No amount of persuasion that night would change the mechanic's mind. Next morning, Stadter filed a flight plan. He figured the Commander would be good for 145-150 mph. on one engine, burning 20 to 22 gals. of fuel per hour. At this rate, he had enough fuel for a good 10 hrs., so he filed his flight plan estimating Brownsville in 8 hrs. It took some convincing to obtain permission for the take-off as the local authorities did not want an accident on their field.

Victor Stadter (right) is pictured above showing route of his single-engine flight to Emmett R. Morris (left) of Aero Commander factory and H. J. Ferguson (right), operator of Upper Valley Aviation at McAllen, Texas, and owner of the Aero Commander which Stadter brought home on one engine. Morris was co-pilot with Bert Bantle, chief test pilot, on historic single-engine take-off and 1,100-mile flight from Oklahoma City to Washington, D. C., in 1951, using the original Aero Commander prototype. Stadter leases the 680 Super Aero Commander, using it for bush flying in Central America. He carries heavy loads in it to and from rough fields in jungle and mountain areas, some of the strips being 8,000 ft. above sea level.
—(FLIGHT MAGAZINE Photos.)

Compelling reasons? We have interviewed Stadter and we still don't understand how any pilot could justify the risks involved in taking off a disabled twin-engine airplane under the conditions which prevailed. Unlike the factory crew which had made the original Aero Commander single-engine hop, Stadter was no engineering test pilot. He had neither nose-wheel steering nor hydraulic pump to supply the brakes, landing gear and flaps. He had already tried and succeeded in a take off, but he had the mechanic's help with the hand pump on that one. It should have been hair-raising enough to discourage anybody, as it did the mechanic. But not Stadter. Now he was going to attempt going out single-handedly, loaded with the weight of full fuel tanks. Stadter was a desperate man, indeed, or he would call it off. How desperate can you get?

The hazards he faced were many. Consider, for example, the difficulties involved in maintaining directional control on the take-off while trying to apply full power to the right engine, its propeller pulling the right wing around. Braking was necessary but it had to be used with finesse or the airplane would never reach enough speed for rudder effectiveness, much less flying speed. Stadter had only 4,000 feet of runway to use. He could never accelerate sufficiently from a standing start within that distance.

Stadter's take-off was to the East

Vic Stadter decided to make his single-engine take-off from Belize after watching this mechanic and his helper. Note ball-peen hammer being weilded by helper. Engine, cowling and spinner were remounted but prop blades, cylinders and pistons were carried as cabin cargo. Disabled engine was replaced with new one in Brownsville at flight's end.

into a prevailing wind of 8 to 10 knots but he couldn't start in that direction — he had to start his roll into the opposite direction on the taxiway or ramp. But how do you even start gaining momentum without nose steering? Stadter did it with the assistance of the mechanic, who ran alongside the nose, kicking the nosewheel to counter against the right engine's off-side pull.

At the end of the runway, he still didn't have enough momentum to start his actual take-off roll. So Stadter and the running mechanic had to make a circle, all the time slowly gaining momentum. No brakes here — it would slow him, it would take a lot of strength for hand-pumping which would be needed desperately later in the run, and it would exact brake wear which the pilot couldn't afford, having already punished the brake the day before on his practice take-off; he had to have enough braking left to complete the take-off this time, too.

After all this touch-and-go maneuvering, Stadter finally came out of his preliminary circling and entered the runway on an Easterly heading. He probably had 15 to 20 mph. of momentum, the mechanic having fallen away, unable to keep up with his nosewheel kicking. From here on it would be a matter of gently adding power and hitting the brake, the latter swiveling the nosewheel enough to take him from the left side of the runway back across to the right side, where more power could be added. Too much power would groundloop the airplane. Just the right amount would swerve the airplane gradually to the left side of the runway, where braking could then be applied again to swivel the nosewheel and again bring the airplane back to the right side of the runway.

S-turning from side to side, the crippled Commander gradually accelerated down the runway into the wind, airport attendants chasing it in a car and a fire truck to be ready if the pilot lost control at the critical point, which would come later. Inside the Commander, Stadter was busier than the proverbial one-armed paper hanger. To visualize his desperation, consider the manual activities which were necessary: He had to pump the hydraulic lever with his right hand. He had rolled in nose-down trim before the start because he would have to keep the nose on the ground at all costs. His left hand was working the right throttle, his arm holding right aileron to keep the right wing down against its engine power. His right foot was hitting the brake as needed and feeling desperately for rudder pressure which would be long delayed in coming.

"I thought I'd never get up to 40 mph.," Stadter told us.

Even then his rudder wouldn't come into effectiveness. Wringing wet with sweat, his right arm tiring from operating the pump handle, he jockeyed the zig-zagging Commander a thousand feet, two thousand feet and past the midway point. Trees were rushing up from the end of the runway. Three thousand feet down the strip his right foot sensed the pressure building up in the rudder and at about 55 to 60 mph. he knew the rudder was biting into the airstream and grabbing hold. Now he could add some real horsepower to the right engine.

Up around 90 mph. he had safely passed through normal minimum single-engine control speed of 85 mph. But 100-110 mph. came rapidly and with it the desperate pilot firewalled the right throttle, lifted the nose and started flying at last. He was too busy fighting the horsepower and the hydraulic pump handle to study the engine instruments, but had he looked he would have seen the tachometer registering 3,400 rpm. and the manifold pressure gauge registering 56 inches of boost. We don't know how much horsepower that represents — the right engine was probably developing well over 400 hp. because its maximum rating for sea level take-off is 340 hp. at 3,400 rpm. and 48 inches of manifold pressure and he exceeded this.

Stadter did see the trees coming, however, and managed to get the low left wing up as his landing gear hit the brush. The airplane dipped only momentarily behind the brush, however, and then staggered out while the pilot pumped up the gear and 15 degrees of flaps he had used for the take-off.

As he staggered out of the trees, Stadter lowered the nose slightly and built up speed. Now he was on his way, taking up a heading for home. But home was over a thousand miles away, first across a couple hundred miles of impenetrable jungle and then straight across the Gulf of Mexico. Pondering these unsavory facts, Stadter kept the Commander climbing, eventually leveling off at 6,000 ft., atop some scud which soon became an undercast.

"There was no sweat climbing out," Stadter told us. "The airplane was really going with only one engine. I pulled the power back to 2,600 rpm. and 30 ins. but then the engine started heating up and I put it back in a climb at 3,000 rpm. and 40 ins. to go to a cooler altitude. I tried 9,000

ft., soon decided on 12,000 ft. and finally settled for 12,500 ft."

Understandably, Stadter was amazed that the airplane could do such climbing on one engine. But when he leveled off and cruised the power back the temperatures would go up because of the leaning — this engine requires rich mixture for cooling. Then he would allow the airplane to drift down. He began roller-coasting and for the rest of the trip it took him up and down between 3,000 ft. and 12,000 ft., with and without climb power.

By ADF he obtained a fix and was across the jungle in an hour but a check of the fuel supply shook him. He had averaged 190 mph. ground speed, aided by a tailwind, but fuel consumption had averaged over 30 gals. per hour since take-off with all the climb power and roller-coasting he had been using. Even though it would mean a greater distance, he gave up his idea of going straight across the Gulf of Mexico and took up an ADF course which would carry him along the coastline via Vera Cruz and Tampico. His mechanic had connected the left outboard auxiliary tank into the main tank before take-off so he could use it, but even this might not prove sufficient to make Brownsville if his fuel consumption remained as high as it had been. Total fuel capacity for the 680 Aero Commander is 223 gals. and 30 gals. hourly would use 210 gals. in 7 hrs., with 13 gals. for reserve. But to make 1,248 miles in 7 hrs. would require an average ground speed of almost 180 mph.

"I had already averaged better than 190 during my first 250 or 300 miles, so I figured I'd better keep on doing what I had been doing," Stadter says.

To get an idea of what he could do, we later took another 680 Commander up to 12,000 ft. Emmett Morris, co-pilot on the 1951 single-engine flight and now chief of flight for the factory sales department, was with us when he interviewed Stadter in McAllen after his flight. Stadter's 680 was Serial No. 416 and Emmett's was No. 400, the two being manufactured about one month apart. Emmett's carried three or four times the equipment Stadter has and with three of us in it, we were grossing more than Stadter on his flight. At 12,000 ft., we set up 13 ins. of manifold pressure for the left engine for zero thrust condition and opened the right throttle for 2,800 rpm., which is the setting Stadter said he used at 12,000 ft., and 33 ins. of manifold pressure, with the airplane indicating 135 mph. Because his airplane was lighter, we figure Stadter was indicating 145 mph. or a little more in his 12,000-ft. cruise for a true air speed of 170 mph. or so on one engine.

This is how Vic Stadter's Aero Commander looked when it was rolled into the hangar at end of 1,248-mile single-engine trip, left engine's prop blades, cylinders and accessories being unloaded from the cabin. Tools used back at Belize were not enough to remove the propeller hub, so it was left on the shaft with the spinner.

Back on his international cross-country single-engine trip, Stadter burned out first one tank and then another and eventually made it along the Mexican coast past Vera Cruz and Tampico to the border and International Airport at Brownsville gave him a straight-in approach with his main gauge bumping on the empty mark. When the airplane was refueled, it was found that the tanks had 13 gals. of fuel remaining in them. He had pushed the right engine all the way and his average ground speed of 170 mph. showed he had long since run out of tailwind, the average wind effect winding up as zero for the total distance.

Recapitulating, the figures for the desperation trip were approximately as follows: Non-stop distance flown, 1,248 miles; elapsed time, 7 hrs. 15 mins.; average ground speed, 170 mph.; altitudes flown, from 3,000 to 12,500 ft.; fuel consumed, 210 gals. or more.

Stadter's left engine had logged 900 hrs. when it failed. The good engine on the right side had about 400 hrs. on it at the time it brought him home.

Stadter's experience proves two points of interest: First, it confirmed the Aero Commander's remarkable capabilities. But because these had long since been demonstrated by the 1951 single-engine flight, and can be demonstrated readily at any time under simulated conditions sufficiently to convince any doubter, Stadter's proof can be described as being unnecessary. Because of the hazards he risked in the take-off, Stadter agrees it was foolhardy even to attempt it and he strongly warns others not to try it — any pilot who has two engines should obviously use both of them and if one of them will not develop full power no take-off should be attempted. The Aero Commander factory had no knowledge of Stadter's plans and would have discouraged him had there been opportunity. H. J. Ferguson, who owns the 680 Commander which Stadter was using on a lease, would have refused permission for the adventure had he known of it, but it takes 16 hours for a cablegram to travel between McAllen, Texas, and Belize, British Honduras — over twice as long as the actual flight took.

The second point of interest the flight develops is this: There is still a considerable amount of adventurous flying going on in modern-day bush operations and more especially in Central American areas. In fact, with Stadter as a prime example, "adventurous flying" is a mild term for it. Stadter sought no publicity for his adventure — he did not come to us; we very definitely went to him and this took some doing to catch him between trips. Even then a lot of questions had to go unanswered but Vic Stadter is convinced he's lucky indeed to be around, still flying the 680 Commander some 110 hours per month.

This survey crew from Texas is waist deep in water doing geophysical exploration for oil somewhere on the flooded plains in Colombia. One of Helicol's 23 copters, a Bell 47, is shown with them. These and other crews work from copters, which transport and supply them as flying mules.

Copters In Colombia

By JACK BUTTERBAUGH

A COMMERCIAL helicopter service has given wings to oil field exploration, production and pipeline crews in Colombia, yo-yo'ing them speedily through trackless miles of swamp, plains and jungle wilderness for the efficient development of rich South American natural resources.

With 23 helicopters, the Colombian copter service known as Helicol last year carried 53,800 passengers and 29,273,723 lbs. of cargo in oil company wilderness work. The service now operates 23 helicopters. Helicol stands for Helicopteros Nacionales de Colombia. It is owned jointly by Avianca (51%), the leading Colombian scheduled airline, and Keystone Helicopter Corp. of Philadelphia (49%). Helicol was formed in June, 1955, with three Bell Model 47 helicopters. The service flew 1,770 hours the first year, 3,340 hours in 1956, 5,340 hours in 1957 and 16,000 hours in 1958.

Deep in the jungle, these Bells are servicing seismograph crews in drilling small shot holes for subsurface mapping. Note cargo bins on skids.
—(Bell Helicopter Photos.)

We have just returned from Colombia where we watched Helicol at work, its fleet of helicopters busy as bees in the rain forests, the *Llanos* and other remote areas where the only other transportation possible is by foot, beast of burden or canoe. Its "passengers" are workmen and all of their tools and supplies are flown as helicopter cargo. The copters are supplemented at times by Avianca's airliners and Aerotaxi lightplanes.

From Bogota, where Helicol headquarters and 38-year-old Herbert Wild manages both Helicol and Avianca's Aerotaxi system, we accompanied copter operations as they fanned out into the undeveloped areas. Pipeline patrols are flown out of the airport at Barrancabermeja, an oil boom town across the Rio Magdalena from Shell's Casabe facility. A dual pipeline corkscrews northward through the jungle, under water and over marshes, and is a 7-hr. patrol flight in a Bell 47 every Monday. This copter can land at any spot where a washout, fallen trees, water-slick, stained earth or other sign of trouble needs detailed examination

on the surface. In addition to pipeline patrols, copters from this town also operate aerial geological surveys, road construction surveys, transport of crews and ambulance flights. Workmen at isolated sites are rushed by copter for medical attention when an accident happens, usually completing the emergency trip in one-seventh the time required by boat or muleback, for example.

Three Bells are based there and between charter assignments two of them are used to train new pilots, graduating a student every six months on an average. Recruited from the pilot ranks of Avianca and Aerotaxi, each Colombian student receives a minimum of 220 flight hours of instruction.

Out in the tangled jungle, copters have replaced mules and dugout canoes for oil exploration workers. One seismograph shot hole, for example, was just 7 minutes from camp by copter but it took a seismic team two and a half days to reach it by mule and canoe.

"A single helicopter does the work of 150 mules," is the way an oil company spokesman evaluated Helicol's contributions to work in the difficult area.

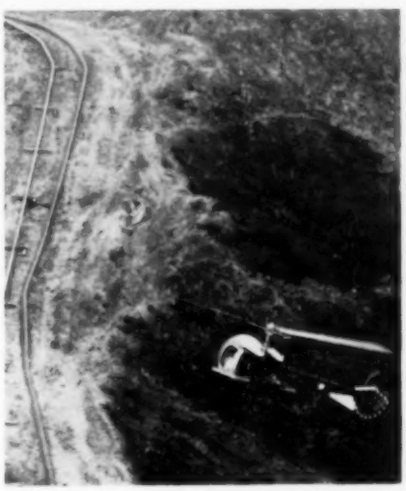
Helicol copters, on contract to both Shell and Texaco geophysical parties, are used primarily to forge jungle supply lines and expedite the tedious drilling operations deep in the *monte*. The jobs of surveying and instrument recording are still land-based. Native labor clears the trails as surveyors' lines are literally chopped and hacked through the jungle, straight as an arrow and cutting up huge concessions of land area into digestible bits and pieces.

Every move in the wilderness is by copter. The Bells shown here are helping workers locate and drill a shot hole. The copter at right is hauling sawed-off oil drums of water for the hole drill.

—(Bell Helicopter Photos.)

Texaco's seismic survey, performed by Petty Geophysical of San Antonio, Texas, calls for detailed records every 1,650 ft. along a line. Copters fly in crews, drill equipment including water for shot holes. Each shot hole has its own "heliport" or clearing. This involves an impressive copter hauling job, for each drill, as an example, consists of more than 45 items weighing better than 1,500 lbs. Each party of shooting crews usually keeps four drills working at all times.

Jungle "hole jumping" in this geophysical exploration is a gruelling oc-



Pipe lines carrying oil through the Colombian wilderness are patrolled by helicopters. Note giant trees of rain forest below, with copter flying below tree tops along pipe line. Whirlybird at right is patrolling a mountain-top pipe line.

—(Bell Helicopter Photos.)

Rivers provide convenient flyways for oil company helicopters deep in the jungle. This one is shown as it nears camp from a day's work far back in the wilderness.
—(Bell Helicopter Photo.)

cupation. A pilot's prime possession is unshakeable faith in his helicopter. The only landing spot within an hour's flight is frequently the shot-point "heliport" and setting down in it is comparable to landing in the bottom of a well. Finding the brown speck of the heliport in the seemingly solid green sea of heavy vegetation is as difficult as locating a curbside parking spot in Manhattan at noon. But the work crews must keep moving and

Thatched huts serve as temporary work camps for the copters and the oil company crews they supply. Narrow hut below is improvised copter hangar. Crew at left is performing maintenance on a Bell 47. Chow time in the work camp (bottom right) pictures oil company men at dinner.
—(Bell Helicopter Photos.)

we saw helicopters lifting in and out of crude jungle helistops like a band of nervous yo-yo's. At day's end, the crews are flown back to the nearby "fly camp" and the helicopter pilots then return to base camp with records of the day's work and orders for supplies. Mechanics do their field servicing and maintenance at night to keep the Bells in the air seven days a week. Helicol uses the 3-place Bell Model 47D-1 exclusively in the jungle because of its light weight. Six Bells used by the Shell and Petty seismic crews average 80 to 85 hrs. of working flight time every month of the year.

Upriver from the tangled jungle operations, Helicol services a crew from Geophysical Service, Inc., of Dallas in the Finca San Fermin area for Texaco. Two Bells work with this 21-man party. One is kept busy all the time, the other being a standby.

We saw how thoroughly Helicol's helicopters and personnel synchronized their services with the working needs of the oil exploration parties, the two merging together as an efficient, highly-productive team. This was especially noticeable in the great *Llanos* area of broad table-top plains stretching endlessly from the Cardillera Oriental mountains and laced with a network of rivers. Here six Bell 47's are working with General Geophysical of Houston under contract to Shell-Condor and Mobil Oil and known generally as Shell Seismo No. 1.

From six in the morning to four in the afternoon the copters leap from crew to crew, everybody being dependent upon them for total transportation and supply as the surveyors'

Helicol Bell at left awaits a well drilling specialist servicing the oil company rig in background. The Avianca DC-3 above is moving a temporary helicopter work camp somewhere on the lonely Colombian prairie.

—(Bell Helicopter Photos.)

chains and shot-hole crews stretch across the horizon. Pilots and their copters pause only to partake of sandwich lunches and the whirlybirds resemble grasshoppers jumping through the grassland. It takes five copter hops to move each drill crew and its 2,000 lbs. of gear between the 50-ft. holes they punch.

In this one operation on the broad *Llanos*, Helicol copters flew 7,586 revenue flight hours and made 300,000 take-offs and landings during the 12 months ended March 31, 1959. They lifted 41,821 passengers and in 38,066 loaded trips they hauled 8,573,200 lbs. of tools, equipment and drill water. Busiest months were last September, when they logged 722 hrs., and November, when they carried 4,230 passengers and 866,000 lbs. of equipment.

Eight pilots racked up these records only because a 6-man maintenance team kept the 6 Bells in constant mechanical readiness.

Helicol's maintenance center for its fleet of helicopters is located in Barranquilla at Soledad Airport, where a highly-skilled and well-equipped crew performs modifications, 1,200-hr. overhauls and major repairs. Crews in the field perform 300, 600 and 900-hr. inspections, using parts dispatched from Barranquilla.

The maintenance center is staffed by 67 persons including stenographers, clerks and apprentices. Under Maintenance Manager Don Sadler, a Canadian with 11 years of copter know-how, this base can completely rebuild a Bell in just 11 days. Eric Stevenson, a Britisher with 15 years on Franklin engines, is in charge of engine work. Rafael Santos, 12 years with Avianca, operates the stockroom, which carries $250,000 worth of helicopter parts and components. Hollis Russell from Montana schedules the center's work and coordinates with Jim Cutright, chief of field maintenance. A Bell-trained Dutchman, Bert Leidelmeijer, supervises component repair. Oldtime mechanics are numerous — for example C. C. (Tex) Swanson, who learned aircraft mechanics at age 14 back in Ft. Worth, has worked on airplanes in Persia, Guam, Hawaii, Alaska and Colombia and has specialized for the last 13 years in helicopters.

Helicol's voluminous flying workload is possible only because its pilots and mechanics are experts at the tasks of working their copters efficiently and productively in isolated areas. Operations Manager Samuel Sedia, 32, joined Helicol in 1955 after graduating from the Army's first cargo pilot course for enlisted men and earning the Air Medal with his flying in Korea.

There's more know-how than meets the eye in the helicopter's role of conquering Colombia's difficult-to-reach oil country. A country nearly 10 times the size of Pennsylvania, it has less than 2,000 miles of hard-surfaced roads and only 1,425 miles of national railway line. But its pioneering airline, Avianca, and a hard-working young whirlybird company from Philadelphia, Keystone Helicopters, have provided the key to the wilderness with their Helicol fleet of flying machines.

R. L. Lichten (L), Robert Cummings (L), Carl C. Agar (L), Lee L. Douglas (R).

Helicopter Society Honors Three Men, Two Firms

ANNUAL honors awarded by the American Helicopter Society last month went to three individuals and two organizations, with two aircraft singled out for recognition — both of them VTOL convertiplanes. The group's highest honor went to Robert L. Lichten (left, above) of Bell Helicopter Corp. for development of the Bell XV-3 tilting-rotor convertiplane for the Army. He received the Dr. Alexander Klemin Award and is Bell's chief experimental project engineer. Robert Cummings, (second from left, above) president of New York Airways, accepted the Kossler Award which went to N. Y. Airways for the most outstanding practical application of the helicopter. Carl C. Agar (second from right, above), of Okanagan Helicopters, and the Army's Brig. Gen. W. B. Bunker received honorary fellowships. Lee L. Douglas (right, above), vice president-engineering, Vertol Aircraft Corp., accepted the Grover E. Bell Award for outstanding work in rotary wing development, this going to Vertol for its development of the Vertol 76 for the Navy, first tilt-wing aircraft to perform successful transition from vertical to horizontal flight and back to vertical. The Society elected Ralph P. Alex, Sikorsky Aircraft, as president; Robert L. Suggs, Petroleum Helicopters, as secretary, and Jack M. Cherne, Vard, Inc., as treasurer.

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Aircraft Model: Bonanza | Date Mfg: 1955 | Reg No: N 3956 | Total Hours: 865

Engine Make and Power: Continental 245 HP | Total Hours: 865 | Hours Since Overhaul: 86

This aircraft has been thoroughly inspected by a licensed A & E mechanic as of the date certified below, plus a careful appraisal by our own inspection-service-management team, provides the basis for this report.

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Full gyro panel. T-3 Auto pilot. Lear LTRA6 with localizer, Omnimeter. Lear ADF-12

REMARKS:

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Certified by Frank Sterner Date of inspection 4/6, 19 59

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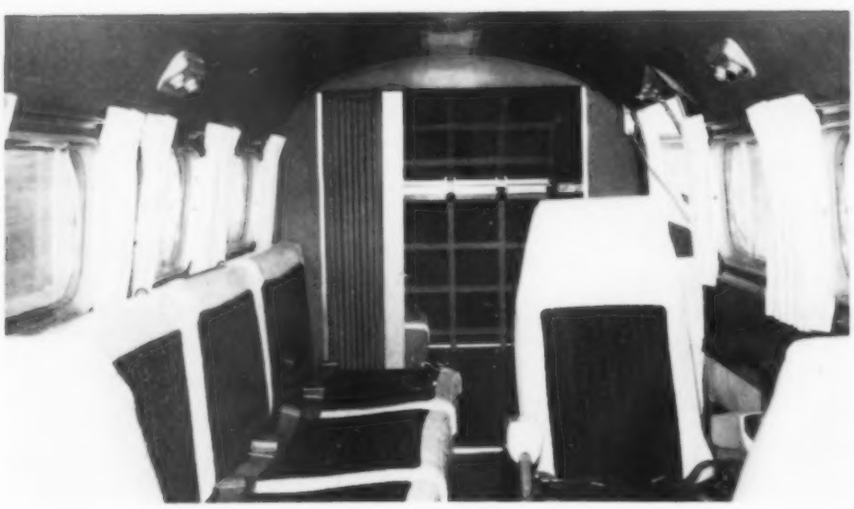


This 1946 Beech D18S has over 25 modern features. Even more are available for it. Note new interior and new accordion doors in cabin with new baggage compartment.
—(FLIGHT MAGAZINE Photos.)

Old Twins Made Better

BECAUSE many worthwhile improvements have been perfected and approved, numerous old-model Beech D18 Twins are being modernized for higher standards in safety, performance and economic value. An outstanding example is the 1946 Beech D18S pictured here, one of many brought up to date by Gray Aircraft Service, factory-authorized Beech service center in Dallas.

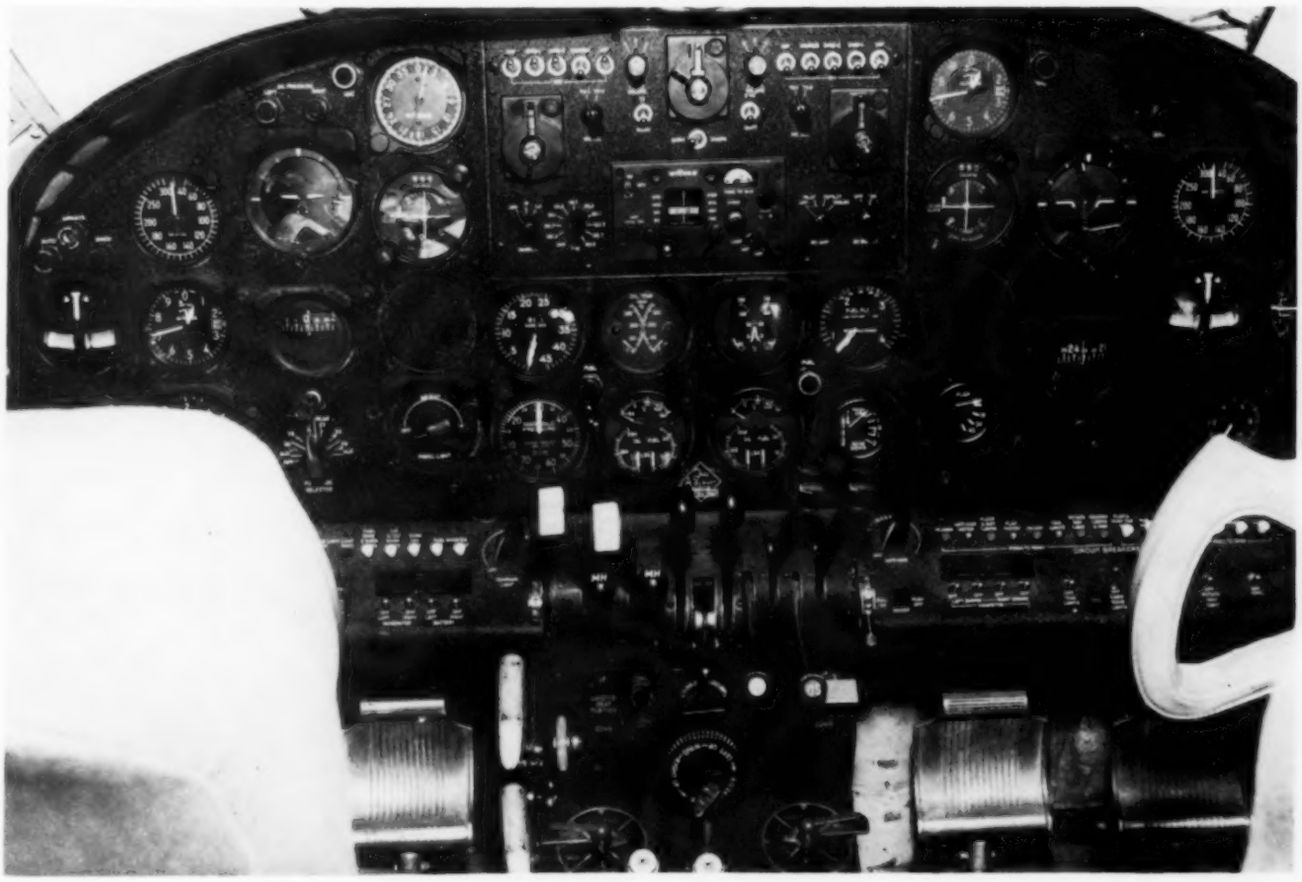
This Beech incorporates the following major improvements and changes: 1. New carburetor ram air scoops. 2. Two new 60-gal. auxiliary outboard fuel tanks. 3. Nose fuel tank removed. 4. All tanks factory reconditioned. 5. Complete lightweight Wilcox Canari communications and navigation system installed in nose. 6. Complete rewiring. 7. Dual 35,000-BTU com-

Refinements seen in these two photos include stair door, carburetor ram scoops, jet stacks, landing gear doors, heat exhaust in nacelle afterbody, heater intake by new landing light and extended tail wheel strut.
—(FLIGHT MAGAZINE Photos.)

bustion heaters in wheel wells. 8. Jet exhaust stacks. 9. Stabilizer angle of incidence change. 10. Extended tail wheel gear. 11. Improved main landing gear door system. 12. Extended wing tips. 13. Leading-edge landing lights. 14. Improved oil radiator cooling valves. 15. Rudder return springs. 16. New stair door with square top giving 2 ins. more opening. 17. Complete new wiring. 18. Modernized instrument panel and pedestal. 19. Complete 8,000-hr. inspection and overhaul. 20. All control surfaces recovered. 21. Complete new interior and soundproofing. 22. Double windows. 23. Modified No. 5 and No. 9 bulkheads for installation of accordion doors. 24. Removed No. 10 bulkhead and installed new baggage compartment. 25. Installed new dual heated pitot heads in new plastic nose dome.

Empty weight for the modernized D18S with the listed improvements is 6,519 lbs. and it has a new gross weight of 9,000 lbs.

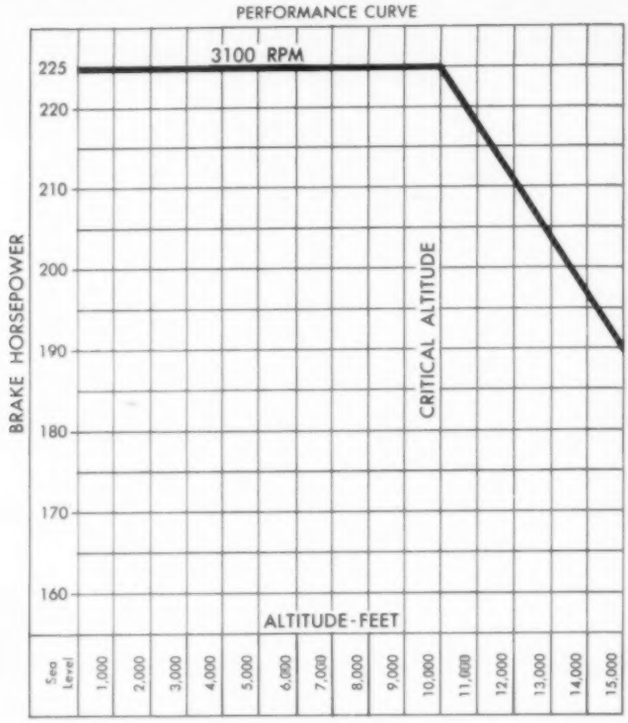
New control pedestal and instrument panel, with new electrical panel, emphasize modernization of old Twin.



New Franklin Has Turbo Blower For Power At Altitude

TURBOSUPERCHARGED FRANKLIN 6VS-355 HELICOPTER ENGINE

PERFORMANCE CURVE

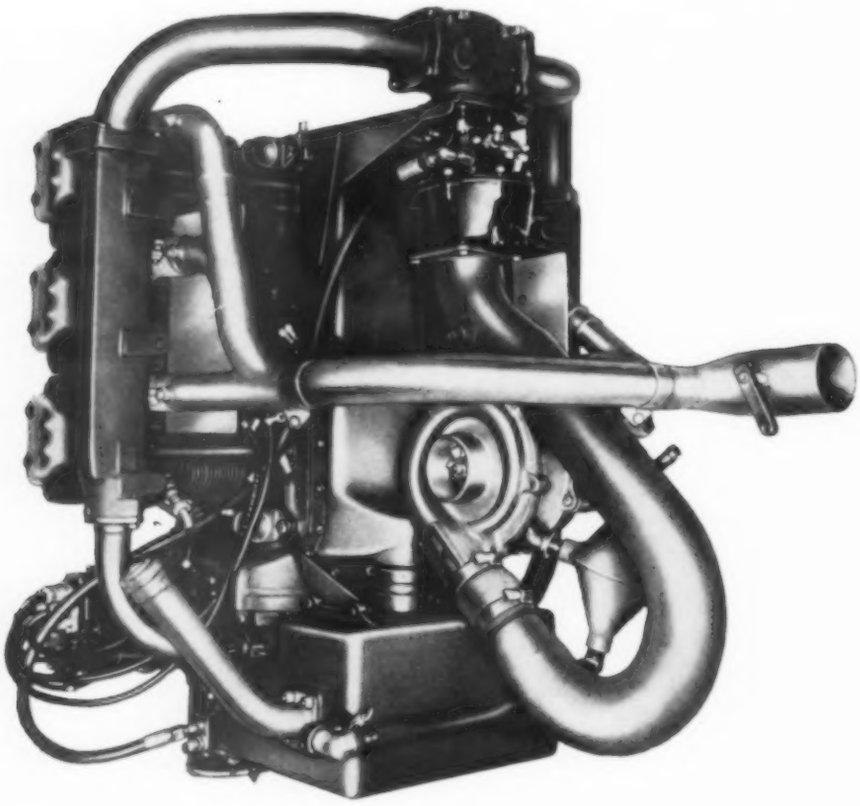


HORSEPOWER at altitude, needed by airplanes and helicopters because they seldom operate at sea level, is available with a new turbosupercharged 6-cylinder, 225-hp. Franklin 6VS-335 engine for light helicopters.

As the power curve on this page shows, it will maintain sea level power up to an altitude of 10,000 ft. The turbo blower operates on exhaust from the engine. It thus provides altitude performance without serious weight penalty, no complicated gear trains being used. The new engine weighs only 40 lbs. more than the more familiar 200-hp. and 210-hp. unaspirated Franklins, widely used in Bell and Hiller helicopters.

The new engine has a 335-cu. in. displacement with bore and stroke of 4.5 ins. by 3.5 ins. Full weight is 360 lbs. and includes starter, carburetor, ignition, fuel pump, turbo blower and complete exhaust system. It is designed to use 100-octane fuel, with fuel consumption of .55 lbs. per brake hp. hr. at normal rated power and .50 lbs. per brake hp. hr. at 70% power.

Aircooled Motors, Inc. says the new engine can replace unsupercharged Franklin engines in Bells and Hillers without structural alteration or engine mount changes. A conversion kit will be offered with which 200-hp. and 210-hp. Franklins can be converted to the new turbosupercharged type. The basic 6VS-335 engine is also FAA-approved for use without the turbosupercharger as an 80-octane, 200-hp. engine. It will also be produced in this version as well as with the turbo blower.



Turbosupercharger on new 6-cylinder Franklin is shown in this photo of vertically-mounted Franklin.

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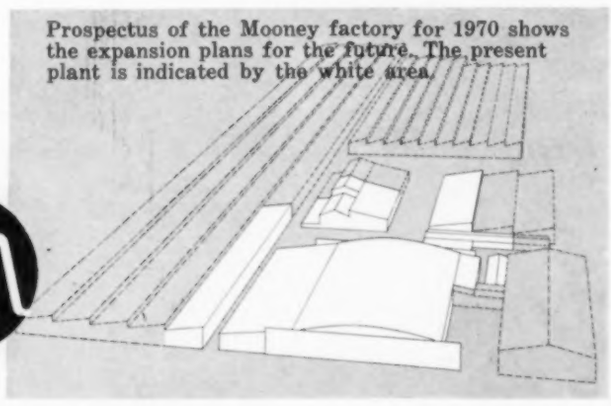


Prospectus of the Mooney factory for 1970 shows the expansion plans for the future. The present plant is indicated by the white area.

Mooney aircraft, inc. Kerrville, Texas

Here are some of the 250 lightplanes which last month visited the new FAA National Aviation Facilities Experimental Center during a fly-in at the 6,000-acre Atlantic City base. Center expects $27 million budget for 1960 and $80 million capital improvement program in next few years.

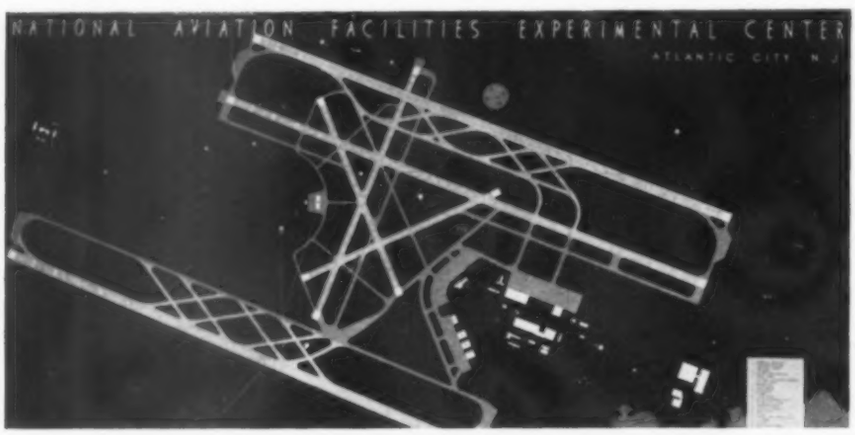
—(National Aviation Facilities Experimental Center Photo.)

Fly-In At FAA Experimental Center

As invited guests for a fly-in, about 250 private aircraft descended last month on the Federal Aviation Agency's newly-established National Aviation Facilities Experimental Center at Atlantic City. At the peak of the incoming traffic, 112 lightplanes were landed in a 58-minute period without incident.

Some 2,200 people toured technical exhibits in the field's big hangar. These included displays devoted to new and proposed automatic aids to traffic control and navigation. Speakers outlined FAA intentions of improving conditions for general aviation, modernizing the airways and developing more efficient and complete utilization of the available airspace. They said projects now in the planning stage or under examination include new and radically different runway configurations, new ground control systems and new and improved instruments. A data processing central unit is going in and an electronics test lab is in use.

The new FAA experimental center's purpose is to develop, modify, test and evaluate systems, procedures, facilities and devices to meet the needs for safe and efficient air traffic control of all civil and military aviation.



Master plan for development of Center is pictured at left — it will have three 12,000-ft. runways for experimental flying. Speakers platform at fly-in is pictured below. Left to right are Congressman Milton Glenn; FAA Administrator E. R. Quesada; Col. W. S. Cowart, Jr., Center director; Capt. A. C. Packard, FAA research director; F. M. McDermott, assistant to Capt. Packard, and FAA Deputy Administrator James Pyle.

—(NAFEC Photos.)

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Jet Transport Can Be The Safest

By MAJ. GEN. J. D. CALDARA
Director of Flight Safety Research, USAF

THE Air Force has been flying jets since 1947. Jet flying not only can be the fastest and most comfortable form of aerial transportation currently available to man — it can also be the safest.

Last year, the Air Force had 894 major accidents — that's all kinds of aircraft — jets, non-jets, and helicopters. Of this total, 698 or 78 per cent were jet powered. Only 22 per cent were non-jet or reciprocating engine aircraft.

These figures might have been justifiable except for the fact that of the Air Force's total flying time, jets accounted for 46 per cent or less than half of the total. What causes this big gap between accident types? In all fairness to the Air Force and in respect to jets in general, the rest of our accident story must also be summarized before touching on specifics.

A majority of the American people don't realize it, but at any given moment of the day, the Air Force has approximately 1,000 aircraft airborne somewhere in the world. In the last 60 seconds that I have been talking, these same airplanes have flown some 4,800 miles. This is equivalent to back and forth across the United States every minute, from the earth to the moon in one hour, or from the earth to the sun in two weeks. This size of an operation exposes a lot of men and machines to accidents.

At Norton AFB in California, the Directorate of Flight Safety Research maintains 52 years of accident and personal flying time records dating back to Orville Wright's first military crash in 1908. For all practical purposes, however, most of our records date back to 1921 when the old Army Signal Corps had an all-time high rate of 506 major aircraft accidents for each 100,000 hours of flying time. Since then, we have used the 100,000 hour flying increment to compute all of our rates.

The major accident rate has generally followed a downward trend except for specific reverses due to unusual circumstances.

Despite the introduction of jet aircraft into Air Force inventory in 1947, the rate has continued downward. In 1947 the rate was 44 — in 1954 it was 20. In 1955, it was 17, and in 1958 we were able to reach an all-time record low of 10.4, a figure of which we're proud but one with which we aren't at all satisfied or complacent. *The only irreducible rate for accidents and fatalities is zero.*

Since 1947 the Air Force has gone all jet in its tactical aircraft and supersonic in all its fighters. Yet the accidents have been reduced each year.

From 1922 to 1950, flying hours increased from 198 to 2,741 per major accident. But, from 1950 through 1958, flying hours per major accident increased from 2,741 to 9,448. In no other nine-year period has the safety factor increased so dramatically.

In 1950, we were flying 16,152 hours per pilot fatality; today we are flying some 28,000 hours per pilot fatality.

There's a grim paradox to this story, however. While the accident rate has been lowered from 44 when we first got jets in 1947 to 10.4 last year, the chance that an aircraft involved in an accident will be totally destroyed has risen from less than one-third in 1947 to almost 59 per cent today.

By the same token, the trend of pilot fatalities to major accidents has increased. Back in the 30's, 8 per cent or about one in every 13 major accidents resulted in a fatality. In 1947, 17 per cent or one in 6 of the majors resulted in a pilot death. Last year, 34 per cent or one in 3 of the major accidents resulted in a pilot's loss of life.

The accident rates of Century Series fighters have been no worse than lower performance fighters. In fact, the accident rate of these Century Series aircraft during the period of initial use has been lower than the rate of most previous models, including non-jets, when they first became operational in the Air Force.

We have different models of jet aircraft in the Air Force inventory today but, of course, they can't all be compared to the Boeing 707, Douglas DC-8 or Convair 880. Nevertheless, there are certain characteristics and problems applicable to all jets — military and civil.

What are the primary causes for jet aircraft accidents based on the Air Force record in 1958? You will remember that I said 78 per cent of all of our major accidents last year involved jet aircraft. The largest accident cause-factor is the pilot himself — 39 per cent.

Jets Demand More Dependability

Our greatest concern today, next to the pilot, is materiel. While accidents involving pilots as a cause-factor have decreased over the last five years, accidents from materiel causes have increased each year. This brings us to the inescapable conclusion that the same degree of quality control exercised in the production and maintenance of reciprocating engine aircraft is not good enough for jets and prop-jets. Increased performance in today's jets requires increased standards of quality control and reliability — all across the board — from the design engineer to the wing commander to the mechanic on the flight line.

We must concentrate more on dependability. The costs of KC-135's, B-52's, 707's, and DC-8's, like our Air Force jets, are too high for us to afford the luxury of a major accident to

EDITOR'S NOTE

For 1958's most significant and lasting contribution to aircraft operating safety, Maj. Gen. Joseph D. Caldara, Director of Flight Safety Research for the U. S. Air Force, last month received from the Aviation Writers Association the Monsanto Aviation Safety Award. In accepting the award, Gen. Caldara discussed jet problems facing the civil airlines and his discussion is carried here because it emphasizes certain basic requirements for jet transport safety as demonstrated through extensive Air Force jet operations. These needs must be met without delay if acceptable jet safety standards are to be attained.

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By winning the U. S. Air Force light-twin competition, the Cessna 310 proved its superiority over every other light twin in this crucial test of power and safety. Now in '59, the *High-Efficiency* 310C climbs still faster on one engine at 440 feet per minute—*with five passengers!*

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High-Efficiency appears prominently in the newly designed interior, too. You get *five* choices of seating arrangements . . . in a cabin so spacious you can relax in a fully reclining lounge! And within the luxurious cabin, you can work, talk, or nap in club-room quiet. A remarkable new muffling system in new, longer engine nacelles mutes engine sounds to a low hum.

Be sure to try all the *High-Efficiency* features of the new Cessna 310C. Price: $59,950 f.a.f. Wichita. Call your Cessna dealer now (Yellow Pages of phone book). Look at all *seven* great Cessna models. Also ask your Cessna dealer about lease plans. Or write: Cessna Aircraft Company, Dept. FM-9, Wichita, Kan.

Quick way to identify High-Efficiency design: flat engine nacelles and big tip tanks for extra speed, lift, and safety

discover the deficiencies.

There's some evidence of progress being made through the years. In 1924 the water distribution off a Liberty engine was involved in a crackup down in Panama. The contaminants that caused the accident in this system were a porkchop bone, two pieces of walnut shell, and an unidentifiable rubber object. Around the impeller of the pump was an old rag, wrapped up tightly. Now I'm happy to report that in the 4½ years that I've been Director of Flight Safety Research, we have not found a single case of a porkchop bone as a contaminant in any of our fluid distribution systems. However, the rags, the rubber hoses, and the unidentified articles are still being found in all of our systems, hydraulic, fuel and oil.

Likely problem areas by phase of flight for civil flight, as based on Air Force experience during 1958, can be presented.

This brings me to the jingle, "It's what's up front that counts." Accident inducing factors are more critical in jet aircraft as pilots enter this area of flight. In the Air Force, the first 200 hours of jet time comprise the most dangerous area for transitioning pilots. Our records show that 60 per cent of our jet bomber accidents involve pilots with less than 200 hours of jet experience. One notable conclusion from studies on the subject is that thousands of hours of conventional flying time do not necessarily enhance the qualifications of a pilot assigned to fly a jet.

Pre-flight planning or briefing is a big item in jet operations. In addition to the old-fashioned items, some additional weather phenomena are covered. These include height of the tropopause, temperature departure from standard, high altitude turbulence and jet streams. Surface weather conditions — ceiling, visibility, temperature, pressure and winds — are most thoroughly covered. There is not time to waste at the end of the ride — because there is no fuel.

Take-Off Monitor Needed

As it has always been in the past, the take-off represents a very critical portion of the flight. The use of acceleration checkpoints during take-off roll, maximum refusal speeds and distance as well as unstick or lift-off speed is of extreme importance. Billboard type markers at 1,000 foot intervals along the runway are absolutely inadequate, although they are the only means to assist the pilot at this time. Some sort of take-off monitor is a must if we wish to avoid a catastrophic abort. The best proof of this is the fact that B-47 aborted take-off accidents are consistently 100 per cent fatal.

One serious problem in the phase is anticipating when traffic clearance will be received in sufficient time to start engines and take-off. Engine ground operating time at idle RPM costs a KC-135 approximately 18 gallons of fuel per minute. A KC-135 grossing 260,000 lbs. at take-off requires about 2,000 pounds of fuel to complete take-off roll and accelerate to climb speed.

It's what's up front that counts, as the commercial jet pilots also discovered when they looked at the size of some of this country's domestic airports prior to take-off. During World War II, the standard Air Force runway length was 5,000 feet. Since then, practically every major runway in the Air Force has been completely rebuilt and extended to lengths of 9,000 to 12,000 feet and some even to 14,000 feet.

Variables in temperature, terrain, and pressure altitude, plus certain inherent characteristics of the jet engine, are of vital importance to accurate performance planning for jet transports. Engine operating conditions which before could be generalized, now must be specific. Consider the flight of a jet aircraft making a run from San Francisco to Denver. The pilot leaves San Francisco with his normal load, 150,000 pounds. The temperature is 65 degrees F. He has an 8,900 foot runway with an elevation at approximately sea level. His take-off roll is 5,600 feet. But assuming he lands at Denver and takes off again, see what he faces now. His elevation is over 5,000 feet in the mile-high city. The temperature is up to 100 degrees F. The same airplane with the same normal load of 150,000 lbs. maximum, gross weight, now requires a *12,400-foot take-off roll*. At Denver he has only a 10,000-foot runway, however. He can't make it. To get airborne in that 10,000 feet, he must *reduce his gross weight to 138,000 lbs.* And if for some reason he fails to properly calculate these variable factors, we have a new set of figures to add to our take-off accident statistics.

Collisions Inevitable Without New Device

The biggest headline makers in aviation today are mid-air collisions. Although flying is safer than ever today and we can prove it whether we measure our safety in airline miles or in hundreds of thousands of hours successfully flown, public opinion is formed by every accident we have — particularly dramatic ones like mid-air collisions. Mid-air collisions represent only 3.5 per cent of all major accidents in the Air Force. I don't mean for one second to minimize the importance of mid-air collisions. I want only to emphasize the disproportionate effect this type of accident sometimes has on the public mind in terms of the over-all safety picture.

The reason most mid-air collisions ever occur is because the days of "see and be seen" flying are gone, and I'm glad to say, we in the Directorate of Flight Safety Research recognized this problem long before the famous Grand Canyon and Pacoima School disasters. In fact, we first expressed the need for an anti-collision device in aircraft cockpits over five years ago, and both of these accidents could have been prevented had such a device been in existence.

Aside from traffic control, there are two factors at work to make a collision possible, and there are two factors which every jet pilot — military and commercial alike — must know and respect. First, the almost fantastic rate of head-on closing speed in high performance aircraft and, second, the built-in limitations of man whose reactions are appallingly slow when pitted against the rapidity of events that can occur during high speed flight.

If two 600-mile-an-hour aircraft such as the 707 and DC-8 should ever get on a collision course 1.5 miles apart, a collision is inevitable. Let me tell you why. One and one-third miles is the maximum distance at high altitudes that the human eye can perceive another object the size of an aircraft. Caused by the fact the eye has nothing other than infinity on which to focus and due to the fact air is less dense, this condition is called high altitude myopia. At jet aircraft closing speeds this amounts to four seconds of time. It takes .1 of a second for the eye to perceive that an object is in front of it and another .5 of a second to recognize what it is. It then takes a full second for the brain to react with a decision. Considering the amount of time spent on less important decisions, a one-second delay is not unreasonable. It then takes .4 of a second for the human body to react or take emergency action. Once the controls are activated, it takes two more seconds for the aircraft to deviate from its flight path.

A good example of this situation occurred in March of this year near Twin Falls, Idaho, when two Air Force B-47 jet bombers clipped each other in flight, but fortunately without disastrous results. They were cruising along on a collision course at 30,000 feet, each flying about 600 miles per hour which is a closing rate nearly twice the speed of sound. The pilots were looking through the windscreen

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ATTRACTIVE LEASE AND FINANCE PLANS

and only one saw the other B-47 heading right at him. He threw his yoke over and ducked under the second B-47, ripping a gash in its right wing and tearing off part of his own vertical stabilizer. After flying around awhile to burn off fuel, both landed. Our investigation showed the pilot of the second jet never did see the first one and didn't know what had hit his plane.

In the spring of 1958 as a result of an Air Force contract, the Bendix Corporation reported that a collision avoidance system was possible. This feasibility study showed that an anti-collision device must:

1. Indicate the threat
2. Provide a bearing to the threat (so the pilot can tell whether to go left, right, up or down to avoid it)
3. Provide the rate of closure of the threat, and
4. Provide at least 20 seconds warning.

Since the organization of FAA another contract has been negotiated between that agency and Bendix to develop a bread board model.

Although this program shows great promise, another interim device was developed by Motorola Radio at the request of the Edwards Air Force Flight Test Center. Rather than radar, this utilizes a radio transponder. It is limited in distance but will provide adequate time for the pilot to take the necessary avoidance action. It's also a cooperative device — it must be installed in all aircraft, and most important of all, it is estimated that it will be of reasonably low cost.

While this is not the ultimate solution and might not be applicable to Mach 2 or 3 transports, it can assist pilots in avoiding collisions in calendar year 1959. Without some kind of assistance, a mid-air collision at high altitude is only a matter of time. It may be today, tomorrow or next month, but if we continue to operate under the "see and be seen" principle, mid-air collisions are inevitable.

In terms of civil operations as well as military, I personally believe anti-collision devices will eventually be required on all aircraft, both large and small.

In addition to circumstances such as weather, which can force a pilot to deviate from an assigned altitude, the altimeter can also be in error or possibly be read incorrectly. Because present standard dial-type altimeters can be off as much as 1,000 feet at high altitudes, this means that two aircraft supposedly operating at 36,000 and 38,000 feet could actually be on a collision course at 37,000 feet.

There are new altimeters currently being tested by the Air Force. Bulova has developed a linear moving tape altimeter incorporating a servo-driven mechanism which, to a great extent, eliminates the lag in altitude presentation due to high speed descent. I have used it and it looks very favorable. An engineer expressed some concern on the fail-safe aspects but I'd rather have that altimeter than one which I can misread by one — or even 10,000 feet!

One of the most important decisions the jet pilots make is when to let down. Fuel consumption by a jet engine increases astronomically as altitude decreases. Premature descents to low altitude or holding at low altitude imposes a severe penalty. After a long over-water or transcontinental flight, jet aircraft cannot descend to make a couple of passes at a field and then climb back to altitude and proceed to an alternate. The pilot must have timely and accurate present and forecast terminal weather conditions prior to his arrival at his destination, early enough so that he can safely continue or divert as the case may be.

The success or failure of many jet flights will depend solely on this judgment exercised in planning descent from cruising altitude. The pilot who lands his jet — and then has to be towed off the runway due to fuel starvation isn't smart — he is lucky and so are his passengers.

The problem of overshoots and undershoots is definitely a case of "It's what's up front that counts!" And you interpret this three ways — it can be the pilot, what's in front of him, or both.

A recent study showed the Air Force experienced 235 major undershoot accidents which were not preceded by any emergency. Of this nature, 195 involved jets. All except four of the 235 undershoots occurred under contact conditions, and all except 15 occurred with visibility greater than three miles. Half involved undershooting by less than 200 feet and the other half over 200 feet.

The primary reason for a short landing is poor airspeed control on final approach, excessive rate of descent or late flareout for landing. The real trick here is the difference between jet thrust and propeller horsepower. Part of the problem is the time it takes to accelerate a jet engine from idle to high RPM and the fact that most thrust increase takes place in the last few per cent of RPM. One modern engine gets a 40 per cent increase in thrust in the last 7 per cent of engine RPM increase.

Landing roll is a bigger problem in jets due to high approach speeds and lack of drag. Although thrust reversers are available on commercial jet transports, the stopping capabilities inherent in reversing props cannot be attained in the jet transport. As in everything else in flying jets, stopping the bird is different. This brings up the need for runway barriers, because if anything up front ever counted, this is it.

Runway Barriers Needed

I am firmly convinced that in the next few years every airport utilized by jet aircraft will be equipped with arresting gear. Present Air Force policy requires landing hooks on jet aircraft to be developed and test work is being conducted to determine if this program can be made to retrofit existing equipment. This is for not only fighters, but bombers and any jet transports in the inventory.

Inadequacies of the existing Air Force gear have long been recognized and there have been some remarkable developments recently. One of the most promising is a barrier with an energy absorbing device which can be used to arrest the landing roll of a lightweight fighter at 80 knots or a B-52 at 400,000 lbs. at 150 knots. This type energy absorbing unit appears to hold maximum promise for an arresting gear system. Over a period of three years the Air Force could have prevented 82 major accidents, saved the lives of 15 pilots and saved over 33 million dollars had an effective arresting barrier been where is was needed.

These are some of the problems that are up front of the pilot. I am not ignoring the passengers by any manner of means. After all, the passengers are the people who buy the tickets. These problems, as they affect the pilot, affect the safety of the passengers. A compromise in any of the problem areas up front of the pilot can be the end of the road for the passenger. It's what's up front that counts and as far as the passenger is concerned it's the pilot who is up front and only as the pilot is able to recognize, understand and solve the problems in front of him is the passenger assured of a safe flight.

None of these problems are insurmountable, but the 100 per cent perfect piece of equipment available in 1963 won't prevent aircraft accidents in 1959.

It is my firm belief that equipment now under test can contribute materially to the safety of military and civilian jet operations. I strongly urge that we avoid a continuation of paralysis through analysis. Let's get this new equipment and in so doing guarantee to every passenger on civil airlines that the best and only the best is what's up front.

New Business in the Hangar

L. B. Smith Producing Pressurized B-26

FOLLOWING many months of research and engineering on the Douglas B-26, L. B. Smith Aircraft Corp., International Airport, Miami, is going into production on a new executive version, to be marketed under the name of "Tempo." Both pressurized and non-pressurized cabins will be offered. Main jigs are completed and the first airplane is now in the primary stages of production, with completion scheduled for September, 1959. Complete details will be announced soon.

LOCKHEED AIRCRAFT CORP., has announced sale of a four-engine 600-mph. executive Jetstar to Ryder System, Inc., of Miami, which owns three trucking lines and a truck leasing and general leasing business operated throughout the U. S. and Canada. J. A. Ryder, president, and his two managing vice presidents, R. C. Allais and Arthur A. Rosewall, are all pilots. The Ryder Jetstar will be delivered in 1961 and will be powered by four P & W JT-12 engines, which produce 3,000 lbs. of thrust each but weigh only 430 lbs. each.

REMMERT-WERNER, INC., Lambert Field, St. Louis, has delivered a new Super-92 DC-3 to Fairbanks, Morse & Co., Chicago, Jack Jones, chief pilot. It includes outer panel tanks, retractable tail wheel and other drag-reducing modifications for cruising speeds of more than 205 mph., and is equipped with Bendix radar, Sperry A12 autopilot with extra C-2 gyrosyn compass, H-5 electric horizon, engine analyzer, Collins 18S-4 HF transceiver, Collins 17L6 transmitter, dual Collins 51R omnis, dual Collins 51V2 glideslope receivers, Narco Sapphire transceiver, Bendix 3-light marker receiver, dual Bendix ADF's, isolation amplifiers with dual cockpit speakers and custom radio and instrument panels. . . . Two fresh Engine Works Super-92 engines, new interior and Goodyear wheels and brakes were installed on Canada Packers' Lodestar, Jack Clark and Ted Lawrence, pilots. . . . M. L. Nicholson's Mine Safety Appliances' DC-3 is in for complete exterior stripping and repainting, 8,000-hr. inspection, installation of rotating beacon, crash light and new carpet, and other work. . . . Lario Oil's DC-3, Boots Johnston and Ken Riggs, pilots, was in for installation of a Bendix RDR-1D radar with swingaway scanner mount and hinged radome, new inverters, and Collins 17L7-51X-2 communications system. . . . Jerry Gammill and Jim Ladd brought in Lion Oil's DC-3 for two fresh Engine Works R1830-75 engines. . . . Paul Mellon's DC-3, Walt Helmer and Art Ray, pilots, received double engine changes with new Aeroquip lines, annual and 100-hr. inspection in the Wrap-Around shop, with interior refurbishing.

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DON REDPATH, general manager of newly-appointed Beech distributor, Atlantic Aviation's Wilmington, Delaware, division, is shown (left) with Bob Oestreicher, Beech regional sales manager.

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tional Airport, is busy with major modifications to Johnson and Johnson's new Convair 340, brought in by Bob Darnall and Marty Lipstein. It is getting customized executive interior, installation of Convair 440 speed-sound kit with increased gross weight, auxiliary power unit, carburetor alcohol anti-icing system, radio system modification to incorporate new navigation and communications equipment, special soundproofing conversion of cabin compressor and system to Shell 1-AC fluid, additional oxygen system outlets and increased oxygen supply, stair door overhaul, miscellaneous bulletin work and new paint job. . . . North American Life and Casualty's DC-3 was in for new interior, picture windows, cockpit modifications including lowering of hydraulic reservoir, complete electrical rewiring, new fire detection system, radar wiring, A12 autopilot, new Janitrol heater in tail, complete oxygen system, new inverter system in tail section and exterior painting. . . . AiResearch personnel working in the Pac-Aero facility installed in a Napier Eland Convair 540 demonstrator a special acoustimat tape and fiberglass soundproofing and double pane windows. . . . Recent Maximizer kit purchasers included Atlas Corp. of Santa Barbara for RCA-Whirlpool's DC-3, Trans-Texas Airways for three DC-3's being added to their fully-Maximized fleet, and Hong Kong Engineering for two DC-3's. . . . Johns-Manville's newly-acquired Fairchild F-27 was brought in for exterior painting by Chief Pilot Bill Van Der Kloot. . . . Crew galleys designed and built by AiResearch for long flights are going into 10 American Airlines cargo DC-7D's being converted by Douglas. . . . Miscellaneous turn-around maintenance and service were performed for American Can's Convair 440 crewed by Capt. G. C. Miller, Woody Yagel and Ed Nelson and for Texaco's Convair 440 crewed by Capt. Howard Pember, John Grall and Sal de Luise. . . . As an added service, AiResearch has installed a weather teletype in the pilot lounge, with national reports recorded hourly and regional reports every 20 mins. . . . An office has been set up at AiResearch for personnel of Frederick B. Ayer & Associates, which provides a New York office for AiResearch personnel in keeping with agreement for AiResearch modification of transports handled by Ayer. . . . Ben Prusek has been named to the new position of administrative engineer for AiResearch and is serving as acting chief engineer following the resignation of George Rice.

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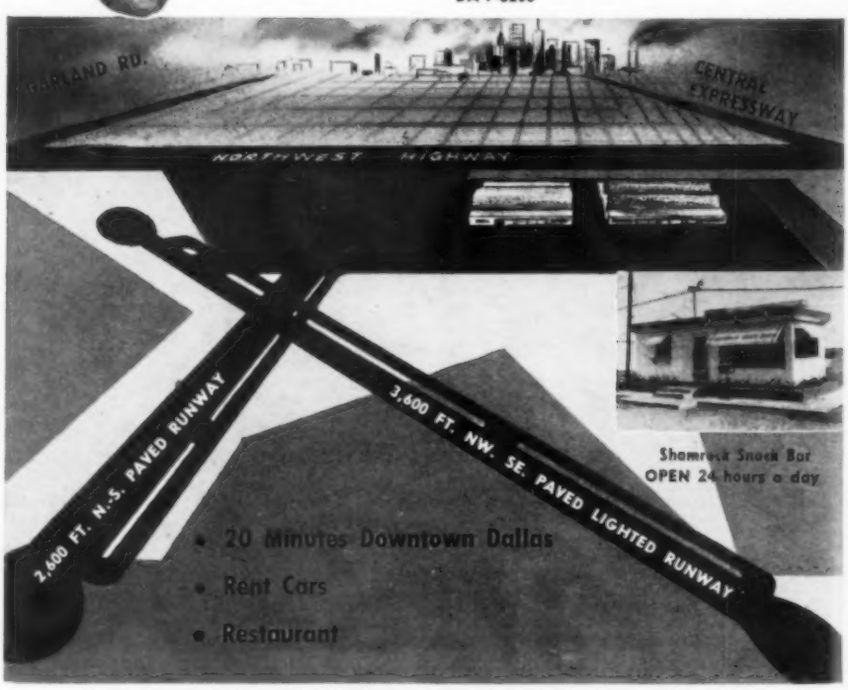

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Field, Dallas, performed tank reseal, installed wheel well doors and converted the engines from 1830's to 1820's on Murphy Corporation's Lodestar from El Dorado. . . . de Havilland Aircraft's Heron received numerous modifications and annual for relicensing under British and U. S. regulations. . . . Parker Equipment's Lodestar, Fred Clayton, pilot, was delivered after receiving modifications including new accessory cowlings with short stacks, new interior, wheel well doors, complete rewiring and other improvements. . . . Sperry engine analyzer installation and engine change were performed on the Price Pipe Line Douglas B-23. . . . Rodman Supply's Cessna 310 received exhaust modification. . . . John Bowling's 3 States Natural Gas Beech 18 received complete rewiring and 1,000-hr. inspection. . . . One of Central Airlines' DC-3's received 11,000-hr. major overhaul and modifications.

EXECUTIVE AIRCRAFT SERVICE, Red Bird Airport, Dallas, performed landing gear overhaul and nacelle modifications for Charley Baudaux and his S. Burnett Estate Lodestar. . . . Stein Lee's Gulf Oil Lodestar was in for engine change and 100-hr. inspection.

READING AVIATION SERVICE, Reading, Pa., installed radar equipment in Floyd Graham's Carrier Corp. DC-3. . . . The Knox Gelatine Grumman Widgeon was in for installation of radio equipment and inspection. . . . Dick Benson's Amphibious Charters Grumman Widegon received new interior and paint job. . . . New interior and painting were performed on Dick Wolf's Preston Mining Beech D18. . . . Electronic equipment was installed in a U. S. Weather Bureau Beech 18 and in Bill Knok's Patterson-Emerson-Comstock Lodestar. . . . A de Havilland Dove received airframe modification, electronic equipment, RAS air-stair door, new interior with seating for 11 passengers and new paint job.

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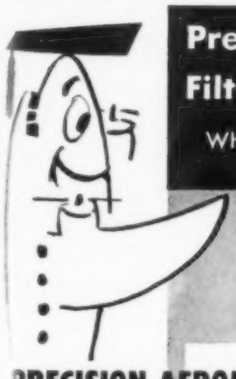

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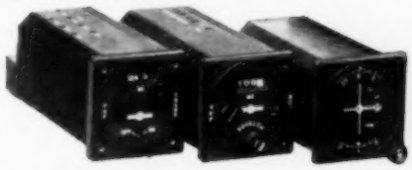

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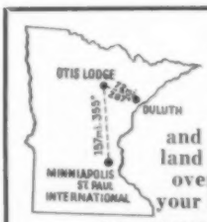

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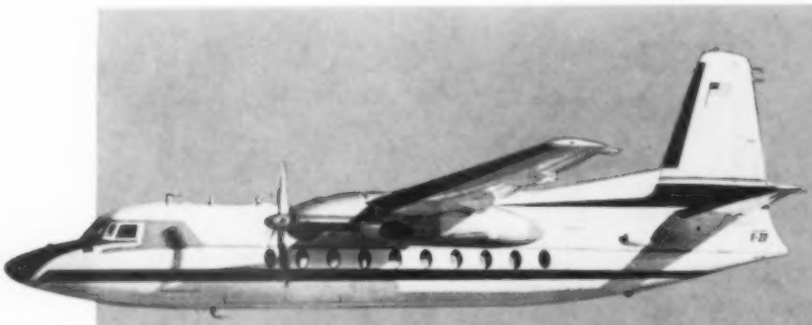

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